The RUBBER AGE

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LATE NEWS of the Industry

National Safety Council Report Shows Growth In Accident Rates

Both Frequency and Severity Rates Increased During 1931—Serious Accidents Responsible For Adverse Showing—Excellent Records Made in Several Individual Plants.

INJURY experience in the rubber industry during 1931 was favorable, but not quite so good as in 1930. In 55 reporting plants with an exposure of over 112,000,000 man-hours, lost-time injuries were 11.78 per 1,000,000 hours worked and days lost were 1.03 per 1,000 hours worked. These injury rates are below the averages of 15.12 for frequency and 1.72 for severity in all industries, and give rubber companies a standing of tenth in frequency and ninth in severity among 28 major industrial groups, according to the report of the National Safety Council. In 1930 the rubber industry ranked sixth and fifth in these rates.

Twenty-five plants have reported consistently for three years. In these plants the 1931 frequency rate is 30 per cent below the 1929 rate, but slightly higher than in 1930. In severity, 1931 experience is worse than for either 1930 or 1929. In all industries combined, frequency rates are down 38 per cent and severity rates 19 per cent, from 1929. Year-to-year comparisons of this character are most accurate when based on the records of such consistently reporting organizations.

Serious injuries are responsible, for the most part, for adverse experience in 1931. But temporary disabilities, also, were more numerous than in 1930 and showed no change in severity from 1929. The 1931 fatality rate is higher than for either of the two previous years. Also, the frequency of permanent partial disabilities rose steadily from 0.46 in 1929 to 0.83 in 1931. This increase, however, has not been reflected in worse severity. Fatalities, therefore, are the most important factor in the high 1931 severity rate.

Among various branches of the industry 1931 frequency rates were highest in rubber reclaiming plants, 18.31, and lowest in rubber footwear establishments, 7.33. The former, also, had the highest severity rate, 3.52; tire manufacturing plants had the lowest rate, 0.79. Permanent partial disabilities were most numerous, in proportion to exposure, in mechanical rubber goods plants. Of the seven fatalities in the industry three occurred in rubber footwear manufacturing. Lost time per temporary disability averaged 24 days in the entire industry and was lowest in mechanical rubber goods manufacturing.

Excellent individual records were made in all divisions of the industry. The outstanding record was made by the Lycoming Rubber Company of Williamsport, Pennsylvania, which employed 1,600 people who worked 2,686,000 man-hours during the year without a single lost-time injury. This company is classified in rubber footwear, in which group plants averaged 7.33 for frequency and 1.46 for severity.

The frequency rate of the U. S. Rubber Reclaiming Company of Buffalo, New York, and the severity rate of

Scanning the Headlines

Accidents in the Industry occurred with more frequency and severity in 1931 . . . GOODYEAR *defends making tires for mail order houses . . .* TIRE PRICES *still remain unsettled by new discounts and mail order house policies . . . Census of Manufacturers give out preliminary* 1931 *figures on tire and tube production . . . Increase in activities reported in many plants and employment rate in industry is advanced . . . Adam's patent rights on rubber suspensions released . . .* CRUDE RUBBER *prices continue to advance . . . June production of crude rubber declines . . .* U. S. RUBBER *reports loss of* $5,000,000 *for six months of* 1932.

the Philadelphia Rubber Works of Oaks, Pennsylvania, were also exceptionally good. The former had a rate of 5.87 compared with an average of 18.31 and the latter 0.12 in comparison to 3.52 for its group.

The best record for large tire manufacturing plants was made by the G. & J. Tire Company of Indianapolis, Indiana, which averaged 2.88 in frequency and 0.25 in severity. The Dunlop Tire and Rubber Corporation of America at Buffalo, N. Y., led the small tire plants with a frequency of 6.42 and severity of 0.21. All plants of similar size averaged 22.16 for frequency and 0.82 for severity.

Smaller Rubber Plants Show an Increase in Output and Employment

WHILE the major rubber manufacturing companies have not reported any advance in production schedules, and in one or two instances have made some curtailments, there is evidence of increased activity in several lines of the industry, especially among the smaller plants outside the Akron district.

The Goodyear Rubber Company plant at Middletown, Conn., is reported to have reopened and will give employment to between 150 and 200 workers within the present month.

The Converse Rubber Company, at Malden, Mass., which has been shut down for several weeks, has reopened with employment for 600 workers on a five-day week schedule. Before the shut down the company was only operating four days per week.

The Murray Rubber Company, Trenton, N. J., recently began night shifts with additional help to handle the increased orders for tires and tubes. The Oak Rubber Company, Ravenna, O., has added 30 more girls to its force and reports an encouraging increase in business. The Naugatuck plants of the United States Rubber Company are reported to be running on double shifts.

Several factories which have been dormant for some years are being rehabilitated and reopened, notably the old National Tire and Rubber Company at East Palestine, O., and the Sterling plant at East Rutherford, N. J.

Official Figures on Tire Output for 1931 Set Value at Only $352,924,114

The value of rubber tires and inner tubes made in the United States during 1931 amounted to $352,924,114 at f. o. b., a decrease of 47.9 as compared with a production of $676,909,812 reported for 1929, which was the last preceding census year, according to a preliminary tabulation of data collected in the Census of Manufactures.

Balloon tires and tubes naturally maintained a greater production strength than the high pressure types. The most important items of the 1931 production are: Casings for motor vehicles, excepting motorcycles, 48,989,149, valued at $302,413,277; inner tubes for motor vehicles, with the exception of motorcycles 47,727,713, valued at $43,290,573; casings and single-tube tires for motorcycles and bicycles, 2,319,852, valued at $2,026,098; solid and cushion tires, 189,758 valued at $4,562,704.

Balloon tires produced during the year amounted to 41,909,436, valued at $247,150,866, as compared to 51,640,430 in 1930. High pressure tires numbered 7,079,713, valued at $55,262,411, in comparison with 18,124,793 valued at $191,101,787, for 1930.

The total number of inner tubes produced in 1931 was 47,727,713, valued at $43,290,573, in comparison to 74,043,041, valued at $80,575,518, in 1930. Balloon inner tubes numbered 37,965,952, valued at $33,730,486 as against 50,478,997, valued at $53,435,412 in 1930. High pressure inner tubes amounted to 9,761,761, valued at $9,560,087, in contrast to 23,564,044, valued at $27,140,106 in 1930.

Castings and single-tube tires for use on motorcycles and bicycles amounted to 2,319,852, valued at $2,026,098, as compared to 3,407,743, valued at $3,451,699. Motorcycle inner tubes numbered 211,755, valued at $121,698, in comparison to 329,074, valued at $182,468.

Solid and cushion tires for trucks and trailers dropped to 103,390 valued at $3,440,647 in contrast to the 1930 total of 423,998, valued at $14,896,551. Tractor and trailer tires numbered 86,368, valued at $1,122,057 in comparison to 165,566 valued at $3,050,507 for 1930.

The crude rubber consumed in tire manufacture during 1931 amounted to 272,073 long tons, valued at $57,131,662 in 1931, as against 400,364 tons valued at $180,592,960 for 1930.

The reclaimed rubber used amounted to 71,570 long tons, valued at $6,756,049 in comparison to 115,855 tons valued at $16,639,096 for 1930.

The 1931 figures issued by the government represent production, while those for 1929 refer to sales by manufacturers.

Goodyear Defends the Making Of Tires for Mail Order Houses

IN a recent announcement through the publicity offices of the Goodyear Tire and Rubber Company and signed by Clifton Slusser, vice-president, the company makes a vigorous defence of its policy in manufacturing tires for mail order houses. The statement was in direct answer to articles criticizing this policy which appeared in recent issues of the *India Rubber and Tire Review*.

In reply, Mr. Slusser's statement reads, in part, as follows:

"Akron should know these facts:

"To move the production of Sears tires out of Akron would be equivalent to the loss of a fair-sized factory and the consequent unemployment of thousands of Akron men.

"Tires for Sears are made at a profit to Goodyear.

"Three of the big four tire manufacturers are making tires for mail order and large chain store distribution. Goodrich makes tires for Standard Oil stations. United States makes tires for Montgomery-Ward.

"All of the big four, including Firestone, have been in active competition for this type of business at one time or another in recent years.

"The largest number of chain stores is that of Firestone whose stores outnumber Sears' stores almost two to one."

Tire Prices Still Unsettled by New Discounts and Mail Order Houses

AFTER an attempt by practically the entire industry to raise and adjust tire and tube prices in line with the new Federal Tax Act, the situation would appear as uncertain as before and it now looks as if the industry will have to absorb the tax rather than justly passing it on to the consumer in the form of higher tire prices. The advance now seems a certainty. For although producers who raised prices when the new Federal taxes went into effect have not revised their lists they are reported to be making rebates now to bring prices in line with others. Rumors regarding the action of the mail order houses have been conflicting and it is not definitely known just what policy they will adopt.

As reported in the last issue of THE RUBBER AGE, in-

spection of the new catalog of Sears, Roebuck & Company disclosed that the way has been left open by the mail order house to add the excise tax any time the company sees fit. The tire section of the catalog, printed before congress took final action on the excise taxes, carries the following statement:

"The government is considering adding a tax on tires and tubes. Therefore, all tire and tube prices are subject to any tax which may be added."

Another trouble seems to be that there were too large stocks of tax-free tires in the field when the new taxes went ino effect. Both of the major mail order houses had their warehouses filled, it is said; and independent dealers were generously stocked also under the spring dating system. And so the mail order houses, fearing to raise their prices while the independents were in a position to undercut them held aloof from the manufacturers when the price increase was suggested.

The situation was further complicated by the heavy production of June. Best estimates place the output of the industry for that month at more than 8,000,000 tires, a record for the month. Much of this tax-free production probably still remains in dealers' hands; and as long as it hangs over the market, a general price increase will be difficult.

United States Rubber Reports Loss Of $5,028,399 for First Six Months

NET sales reported by the United States Rubber Company for the six months ended June 30, 1932, amounted to $42,432,014. Sales for the first six months of 1931 were $60,540,047. Net sales of the Samson Tire and Rubber Corporation and of the Gillette Rubber Company, which have not been included with the sales of the United States Rubber Company, amounted to $6,202,020 for the first six months of 1932 compared with $6,290,316 for the same period of 1931.

The loss from operations, after interest on funded indebtedness of $2,267,054 but before provision for depreciation, amounted to $843,369. Provision for depreciation was $4,185,030 and the net decrease in Surplus Account amounted to $5,028,399.

The condensed consolidated balance sheet as of June 30, 1932, was as follows:

Assets

Cash	$ 11,608,236
Accounts and Notes Receivable (Net)	22,384,835
Inventories	22,826,127
Current Assets	$ 56,819,198
U. S. Rubber Plantations, Inc.	$ 27,257,047
Securities of controlled companies	4,175,218
Other securities and mortgages	1,193,621
Total Investments	$ 32,625,886
Property and Equipment	$ 84,478,578
Prepaid and Deferred Assets	2,289,345
	$176,213.007

Liabilities

Accounts Payable	$ 3,321,102
Accrued Liabilities	3,188,279
6½% Notes due March 1, 1933	1,438,000
6% Notes due June 1, 1933	11,810,000
Curren Liabilities	$ 19,757,381
Long Term Indebtedness	$ 69,166,741
Reserves	3,652,706
Minority interest in subsidiary companies	338,700
Capital Stock—Preferred	65,109,100
Net Worth of Common Stock—1,464,371 shares no par value	18,188,379
	$176,213,007

Provision for depreciation for the plantations amounted to $180,000. After this provision and all other charges, the plantations had a loss of approximately $468,000. These results have not been included in the statement of the United States Rubber Company.

Adams Rubber Suspension Patent Released

THE Rubber Growers Association, London, authorities have recently decided to allow the original Adams rubber suspension patent (B. P. No. 236,243) to lapse in order that the fullest advantage may be taken of it by anyone desiring to adopt the process. This form of suspension for automobiles comprises a rubber block formed on opposite sides with radial ribs and grooves, and two plates having corresponding ribs and grooves, so adapted to engage the grooves and ribs of the rubber block as to cause a torsional or shearing action on the opposite surfaces of the rubber block when rotational movement takes place between the plates. Four such blocks or discs are located at the axes of four lever arms, two arms being connected with each axle in place of the usual half elliptic laminated springs.

The arrangement of the rubber suspension members is shown in Fig. 1, where a block of rubber (15) having a central opening (16) is provided with radical ribs (18) and on its opposite sides radial grooves (17). These blocks are placed between a fixed plate (19) and a movable plate (20), both being grooved similarly to correspond with the groovings on the rubber blocks, and connected

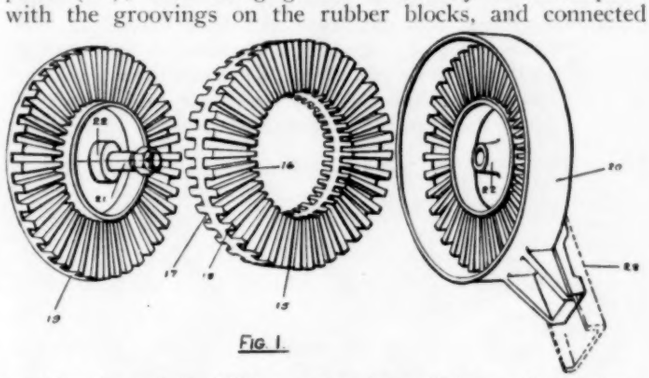


FIG 1.

together by a bolt (21) passing through inwardly projecting centrally arranged bosses. The movable plate (20) is attached to an arm (28), the outer end of which is connected to the axle.

According to Mr. Colin Macbeth, who has tested the appliance for the Rubber Growers Association, this invention is unique in that the load-sustaining spring is arranged around the bearing axis, being a disc of rubber suitably located on the chassis of an automobile. Exhaustive road tests extending over a period of years demonstrated beyond question that this combination—of lever arms oscillating about a rubber support and attached by metal trunnion joints to the usual spring attachment point on each axle—has decided merit as an improved shock damping and suspension system.

The principle of using a rubber disc as an anchorage means between lever arms and their supporting axles is so effective and simple that Mr. Macbeth believes it may recommend itself for more lightly loaded levers, such as door closers, hinges for doors, seat windows, exercising machines, lids, etc., and anchorages for levers required to return to neutral positions. As the Adams radially grooved discs provide for such purposes an effective positive connection, such a combination appears to have advantages not provided by other known commercial applications of rubber as a bushing or oscillating bearing medium. An improvement of the original patent is now being investigated.

(Other news of the industry will be found on Pages 365-369)

RUBBER CHEMISTS:

GOING TO DENVER?

Here Is Complete Information on the Denver Meeting of the Rubber Division, A. C. S.—Excellent Papers To Be Given And a Mystery Mountain Trip Will Complete the Enjoyment

PLANS for the annual Fall meeting of the American Chemical Society, to be held August 22 to 25, at Denver, Colorado, have been completed and there is every indication that the sessions will hold much of scientific value for those who attend. Considerable interest is being shown among rubber chemists, many of whom contemplate making the trip as a part of their annual vacational outing. The publicity and reception committee, headed by Howard L. Wiley, of the Gates Rubber Company, has devised a program of entertainment for the Rubber Division which cannot help but be enjoyed by all.

There will be no banquet this year but instead all day Thursday will be devoted to a trip into the mountains surrounding Denver. The trip has been arranged through the courtesy of the Gates Rubber Company and attempts to fathom what will take place that day have met with no success. Details of the party are being kept a deep, dark secret, but everyone who attends is assured that it will be a day never to be forgotten. It is recommended that old clothes be worn, such as an old golf suit, knickers, etc.

The technical program will consist of eight papers to be presented in morning sessions on Tuesday and Wednesday, August 23 and 24. The meetings will be held at the Shirley Savoy Hotel.

What will practically amount to a "Rubber Special" will be the "Aristocrat" train of the Chicago, Burlington & Quincy, leaving Chicago on Sunday morning, August 21, at 10:30 A. M. (C. S. T.) and arriving at Denver on Monday afternoon at 1:05 P. M. A few are planning taking the same train on Saturday, August 20, but those who take the train on Sunday will have the companionship of many other rubber men for the full trip. Details as to rates from various cities are given below under "Trains."

All aboard for Denver!

TIME: Rubber Div. Meetings, Aug. 23 and 24.

PLACE: Denver, Colorado.

HEADQUARTERS:

Rubber Division—Shirley Savoy Hotel—Rates, $2.50 up.

A. C. S. and Registration—Hotel Cosmopolitan—Rates, $3.50 up.

Other Hotels—Brown Palace, $3.00 up; Albany, $2.00 up; Argonaut, $2.50 up; Colorado, $2.50 up; Adams, $2.50 up; Bellevue, $1.50 up. There are also cottage camps nearby with rates ranging from $1.00 to $3.00.

TRAINS:

Low summer rates are available from all parts of the United States to Denver and it is therefore unnecessary to use the Society's usual identification certificate to obtain the 1½ time rate for the return trip. Special 15-day tickets to Colorado are on sale August 19 and 20. Typical round-trip fares to Denver are as follows:

Boston	$76.80	New York	$66.00
Chicago	30.00	Philadelphia	62.50
Cleveland	43.49	Pittsburgh	48.57
Detroit	40.80	St. Louis	26.25
Kansas City	18.25	Springfield, Mass.	69.72

Get your reservations today and meet the "Rubber Special" in Chicago on Sunday, August 21.

PROGRAM OF PAPERS

Tuesday Morning, August 23

1—Rubber Pigment Ratios in Batch Control — *H. L. Wiley*
2—Slide Rule Calculation of Time-Temperature Relations in Vulcanization — *J. H. Fielding*
3—The Effect of Particle Size on the Physical Properties of Rubber — *G. S. Haslam*
4—Some Factors Involved in the Banbury Mixing of Zinc Oxide — *W. C. Mathews and G. S. Haslam*

Wednesday Morning, August 24

5—Determination of the Temperature Coefficient of Vulcanization II — *R. V. Sandstrom*
6—Evaluation of Variable Temperature Cures — *G. K. Hinshaw*
7—The Effect of Oxygen and Water on the Polymerization of Chloroprene — *Ira Wiliams and H. W. Walker*
8—Some Factors Affecting the Rate of Vulcanization of Chloroprene Plastic Polymers — *E. H. Krismann and E. R. Bridgwater*

Business meeting.

Inspection trips to various industrial plants in Denver, group luncheons, Mountain Park auto trips, all-day trips to Estes Park and to Pikes Peak are available to members in addition to the "Mystery Mountain Trip" of the Rubber Division. See you in Denver!

RUBBER and Its Application *in the* PLATING INDUSTRY*

By NELSON H. NORRIS

ELECTRO plating is as advanced as any of the industries and processes of today, yet for all its modernism, the average layman or manufacturer who does not use the process, puts electro plating on the same plane as alchemy. Wherever acid is used, the rubber industry should keep a sharp eye for possible application of rubber equipment, and electro plating is closely associated with acid.

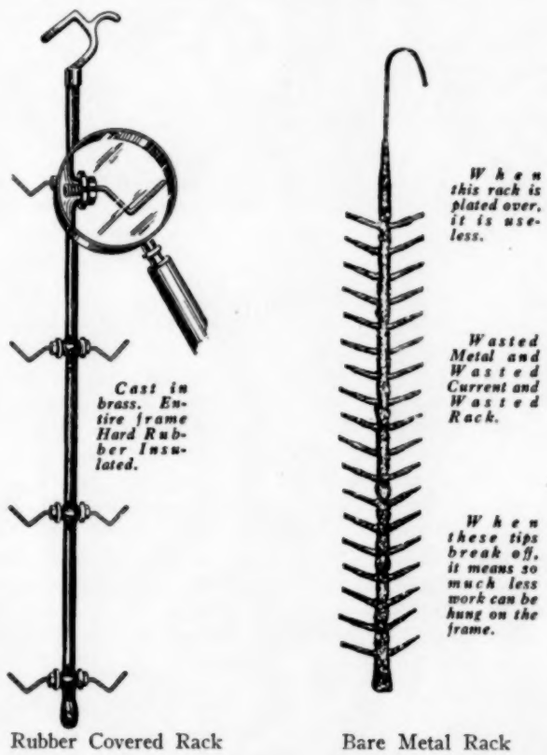
There are two general methods for plating, one is the "roto" method where parts to be plated are dumped loosely in a revolving barrel and plated and the other method is rack plating. We will discuss the rack method as it uses equipment that is particularly interesting to the rubber trade.

For those who are not familiar with electro plating the parts to be plated, if too large or too delicate and liable to damage or to stick together in the "roto" plating method, are hung on a frame or rack which is made of brass. This frame is made to the user's particular demand and the capacity is made as large as feasible for the worker to handle at one time. The parts, after being hung on the rack, are then prepared for the plating operation. First the parts must be cleaned and the rack with the parts is immersed in a cleaning solution of acid or alkali depending on whether or not the part is a ferrous or non-ferrous metal. After cleaning, the parts are given a wash of cold and hot water to neutralize the effects of the cleansing agent. The parts are then ready for plating. Some plating effects are completely automatic, i.e., the rack is hung on one end and the other end discharges with the parts and rack completely plated. In the semi-automatic tanks, the racks must be loaded and unloaded by hand, the bus bars are moving and the rack is hung onto it and after one complete revolution the rack and parts are plated. Then there is the so-called still plating tank where the racks are suspended from the bus bars into the plating solution without any movement of machinery.

The plating racks, with parts, are hung from a bus bar with a current of from 12 to 6 volts and the rack acts a cathode to the anode of the metal being plated to the parts. The plating solution usually has a P_h of approximately 6 but of late some of the newer solutions are as low as $3P_h$, chromium plating having as high as 13. The cleaning solutions are much more powerful but are not as harmful as the plating solutions, inasmuch as the racks are immersed but a few seconds and the plating time ranges from 20 minutes to three hours depending on the thickness of the plate desired. After the parts are plated the rack is removed from the tank and quickly immersed in hot and cold water to neutralize the effects of the plating solution. The parts are now plated and are removed from the rack and the actual plating process is over. But the rack must be prepared for another load of parts. An examination of the racks discloses that it is plated as well as the parts and this coating must be removed before another operation. The rack is therefore dipped in a strong acid to eat off the coating and in this process some of the rack is eaten away as well as the coating.

A rack with hooks to hold 96 parts costs about seven dollars. The rack is made of brass and after two months of continuous service the rack must be either junked or repaired as the case may be. It can be readily seen that this represents a large investment and the depreciation is rapid.

The corrosion of plating racks was found to be so rapid that something had to be done. Protective coatings were tried. The majority of manufacturers seemed to think rubber the best and it has since been proven so.


Cast in brass. Entire frame Hard Rubber Insulated.
When this rack is plated over, it is useless.
Wasted Metal and Wasted Current and Wasted Rack.
When these tips break off, it means so much less work can be hung on the frame.

Rubber Covered Rack — Bare Metal Rack

The cost of rubber covering the racks varies little, ranging from $1.80 to $2.50, and the saving involved more than pays for the cost of the rubber casting. Some of the troubles that were overcome were the replacing of the contact hooks but it was found that by slitting open the

*NOTE: The above paper was presented before the New York Group, Rubber Division, A. C. S., May 18, 1932. Mr. Norris was at that time with the Western Electric Co.

Illustrations by courtesy of the Belke Manufacturing Co., Chicago, Ill.

rubber surface around the hook the old hook could be removed and a new hook could be inserted, the rubber coating then being sealed at the joint with a good cement, which does not allow the acid to work under the rubber covering.

The savings involved are of great interest and the cost reduction was made in five ways.

First the savings in metal were considerable, inasmuch as every time parts were to be plated the rack was plated with an equal amount of material as well. This metal is completely lost as it must be stripped off before the rack can be used again.

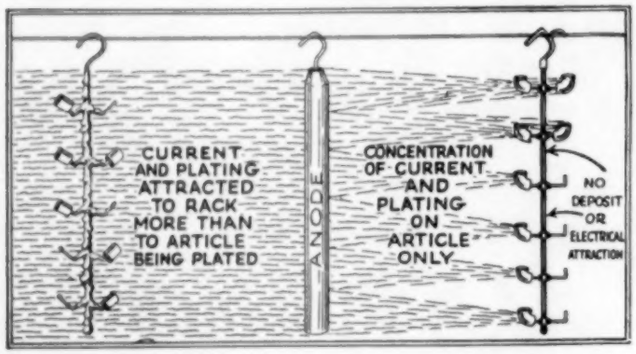
Secondly the electrical energy saved in kilowatt hours in a year's time amounts to savings not to be ignored. The rubber-covered rack does not allow the metal to be plated on the frame and therefore no electrical energy is needed to plate the frame, the energy being concentrated on the parts alone and is not distributed.

Thirdly it takes considerably less time to plate a rack full of parts as the flow of metal and electrical energy is direct to the part and not all over the rack. The time saved is as much as 5 minutes per rack in production time.

Fourthly the saving in time necessary to strip the rack or remove the superfluous metal and the cost of acid may be considered as extremely important.

Fifthly, the greatest saving in the maintenance and frequent replacement of the rack.

What Happens in the Tank


CURRENT AND PLATING ATTRACTED TO RACK MORE THAN TO ARTICLE BEING PLATED
ANODE
CONCENTRATION OF CURRENT AND PLATING ON ARTICLE ONLY
NO DEPOSIT OR ELECTRICAL ATTRACTION

Bare Metal Rack *Belke Rack*

Racks have been covered by various methods; the anode process, the dip process, laid on by hand, and finally painted on with a good acid-proof cement. These methods all have their good points but personally I prefer a soft rubber coating about 3/16" thick. This compound is not as liable to break open due to rough handling.

What are the conditions that the rubber covering must withstand—they are such that it makes any good rubber man shudder. Between hot water, acid, alkali, and rough handling it does not seem possible that a compound could last any great length of time, but surprising as it seems they frequently last six months without showing any great signs of deterioration.

Rubber-covered racks will be the accepted type of rack to be used in electro plating. Yet the user of plating equipment heretofore has had to go out and do the experimentation to find the right type of covering and discover the savings involved, rather than the sales promotion organizations of the rubber industry.

A New Fade-Ometer

A NEW and improved fade-ometer has been introduced by Atlas Electric Devices Co., Chicago, Ill. This testing machine, with improved control of voltage, temperature and humidity, is designed to meet the testing requirements attending the present high standards of color fastness.

An artificial sun is reproduced in the fade-ometer by a violet carbon arc light. Ventilation is maintained and temperature kept within limits by an electric fan. Humidity is furnished by a water reservoir. This new type embodies a number of refinements designed to provide greater precision and more complete control of all the factors attending testing the light fastness of colors.

Atlas Fade-Ometer

An aluminum shell, hinged at six points, encloses the specimens which are placed in metal holders. These holders are suspended from a 20 inch ring, surrounding the arc. This arrangement precludes the possibility of the specimens overheating by contact of the holders with other metal.

The water reservoir of polished copper forms the base of the machine and serves as a humidifier. A series of wire frames in the reservoir are covered with cotton wicking. These frames rest in four inches of water and provide 1600 square inches of saturated wicking, through which all air coming in contact with the specimens is driven by an electric fan, placed below the reservoir. A relative humidity of 52% to 60% is produced. Where higher temperatures are desired as in the case of certain textiles and automobile topping materials, they can readily be attained by resetting the thermostat.

The type FDA Fade-Ometer is made in one size only, capacity 42 specimens, and will replace all previous types, production of which has been discontinued.

Bondogen

A NEW solvent-intensifier, called Bondogen, for use in rubber-gasoline cements and spreader doughs, has been announced by the R. T. Vanderbilt Company, New York City.

Bondogen is a liquid which, when added in amounts of from 1 to 3 per cent by volume to gasoline, greatly increases the solvent action of the latter on rubber. It is, therefore, a valuable aid in the manufacture of rubber cements and spreader doughs, according to its manufacturers.

The advantages claimed for Bondogen are: It shortens the time of churning the cement, increases the smoothness and uniformity of cement, and eliminates ropiness. It allows the rubber content of the cement to be increased, and allows heavier coatings (more rubber) to be applied. It produces easier brushing and spreading and improves the cohesive strength of cemented unions, and has no injurious effect whatever. It obviates the need of using benzol in some cements. It leads to a saving in solvent cost through shortened churning time and higher rubber content of cement.

Activities of the BUREAU OF STANDARDS *Relating to Rubber*

By A. T. McPherson

EDITOR'S NOTE: The following article is a compilation of a number of feature stories which recently appeared in *The United States Daily*, published in Washington, D. C., and comprise a part of a series appearing in that paper, presenting a topical survey of the work of the branches of the Federal Government. The present article covers in a comprehensive manner the entire field of present activities by the Government, touching on rubber and its use and manufacture. Publication is made herein with due acknowledge to the source.

Seeking Basic Knowledge of Rubber Qualities

RESEARCH on rubber conducted by the National Bureau of Standards has for its main purpose the development of basic scientific knowledge of the material—such knowledge as may come from preparing rubber of very high purity, from crystallizing and distilling it, and from measuring mechanical, optical, and electrical properties with high precision. Work of this character is important because rubber, though used extensively, is a material about which relatively little is known. The unique property of rubber which virtually sets it apart from all other known substances is its remarkable ability to stretch, yet the reason for its stretching has not been fully or adequately explained. Even tables of engineering properties which are so commonly used for other materials, are not available for rubber. In consequence, new uses and applications in large measure have to be developed by the tedious and costly method of trial and error. Practical applications have so far outstripped the progress of scientific study that the industry may derive a greater ultimate benefit from an increase in the store of basic knowledge about rubber than from direct assistance with practical technological problems.

A study of the electrical properties of rubber is an investigation which has been in progress at the Bureau of Standards for a dozen years. Rubber-sulphur compounds have been prepared in an unbroken series from soft to hard rubber, and electrical properties such as dielectric constant, power factor, and conductivity have been charted on all these compounds at temperatures from minus 100 degrees to as high as plus 450 degrees F. and at frequencies of 60 to 300 kilocycles per second.

Another investigation has for its purpose the purification of rubber. The highly purified rubber is a clear, colorless, transparent elastic solid, as clear and colorless, in fact, as the best plate glass. This pure rubber can be repeatedly crystallized, thus opening the possibility of successfully fractionating it into its constituent hydrocarbons and eventually of determining the formulas of their molecules.

The Bureau has also succeeded in distilling the purified rubber by heating it in a high vacuum to the temperature of boiling water. The rate of distillation, however, is not sufficiently great to make this process of value for purifying rubber in any quantity.

A study of the thermodynamic properties of rubber is now in progress, the immediate concern of which is the precise measurement of the specific heat of rubber from room temperature down to temperatures of liquid helium, approximately 7 degrees F. above the absolute zero.

The above-mentioned researches are typical of the fundamental work on rubber in which the Bureau is engaged. The major investigation frequently leads to many ramifications. For instance, studies on photoelastic effects necessitated the development of a gauge by means of which sheets of rubber could be measured to a ten-thousandth of an inch without compressing them appreciably.

Studies of Properties of Rubber

THE value of fundamental research in connection with rubber may be illustrated by reference to the work on the electrical properties of rubber. The story of this work is as follows:

In the early 1900's a submarine cable was laid from Seattle, Wash., to Sitka, Alaska, by the Signal Corps of the Army. This cable was insulated with rubber because gutta-percha insulated cable, which was standard for deep sea use, could not at that time be made in the United States.

This rubber-insulated cable proved to be a costly experiment, because after 20 years it had been hauled up and repaired on the average of once for every three miles of its length. When it was decided to replace this with a new cable, the Bureau of Standards was requested to develop rubber insulation for this purpose.

Consideration soon showed that too little was known of rubber to warrant the early construction of a rubber-insulated cable. Accordingly, a standard gutta-percha cable was purchased abroad, was laid, and has since given satisfactory service.

The Bureau of Standards, however, continued the investigation, not as a study of deep-sea cable, but rather as a general study of the electrical properties of rubber without any definite practical end in view, and this investigation is still in progress.

In 1930 the United States Coast Guard approached the Bureau of Standards with a problem pertaining to telephone cables which were laid in shallow water to connect coast stations and lighthouses. Some of these cables were giving poor service and required replacing in the relatively short period of 10 or 15 years.

In many cases, failure was due to deterioration of the rubber, and in the other cases to mechanical wear on account of pounding

by the surf on a shallow coral bottom. Communication on some of the longer lines where failure had not occurred was unsatisfactory on account of the electrical characteristics of the rubber.

Some of the work which the Bureau of Standards had been doing in the study of the electrical properties of rubber was directly applicable to the problems involved, so that the Coast Guard engineers, together with the manufacturers, and the Bureau staff were able to design new types of cables having better and more durable insulation.

The problem of abrasive wear on coral bottoms was solved by applying a tough rubber jacket which was capable of outlasting several times its thickness of heavy steel armor wires. The new type of cables have been in use now for two years and not only show much improved electrical performance, but give promise of long life as well.

While no attempt will be made to assign a definite value to this single application, it may be stated that submarine telephone cables cost $1,000 to $2,000 per mile, and annual purchases by the Coast Guard may amount to the order of $100,000. Consequently, if even only a small improvement is effected, the saving to the Government will more than compensate for the entire outlay for the investigation.

It is proper that the National Bureau of Standards should engage in the development of new knowledge about rubber because it can conduct thorough and unhurried investigations which are beyond the scope and facilities of most industrial laboratories. The results of this work have such broad and far-reaching applicability that they will be of ultimate benefit to producer, manufacturer and consumer, alike.

Standards of Quality of Rubber Products

THIS article describes three avenues through which the National Bureau of Standards comes into direct contact with the rubber industry—Specifications, Commercial Standards, and Simplified Practice.

Virtually all the rubber products used by the Federal Government from truck tires to surgeons' gloves are purchased under specifications which set standards of quality, dimension, and performance.

The advantages of specification buying by the Government are twofold. In the first place, millions of dollars are saved in the decreased cost and increased serviceability of rubber products. In the second place there is an indirect benefit to the public in that the Government specifications frequently set standards for the industry which ultimately benefit every consumer.

The especial need for specifications for rubber products may be illustrated by reference to surgeons' gloves. Two gloves may be so similar in appearance, "feel," color, and other characteristics that even an expert can not distinguish between them by looking at them, and yet one of them may become hard and brittle in a few weeks while the other may be practically unchanged after several years. Two or three sterilizations may render the one glove flabby and useless, while the other may still be serviceable after a dozen or more treatments with live steam.

The latest Federal specification for gloves will enable the Government to secure the latter type. Important features of this specification are a sterilization test and an accelerated life test whereby a few days in an oven or in a bomb containing oxygen gas under pressure afford a convenient and reliable index of the quality of the rubber.

The majority of the Government specifications for rubber products are promulgated by the Federal Specifications Board which was organized about 10 years ago to compile or adopt and promulgate standard specifications for materials and services and to bring Government specifications into harmony with the best commercial practice. The Director of the Bureau of Standards is chairman, ex officio, of this Board, and various members of the Bureau staff serve on the technical committees which formulate the specifications.

In addition to the Federal specifications, several of the departments of the Government issue specifications of their own. These concern particular or highly specialized products that are required by only one branch of the service, as, for example, the field telephone wire used by the Signal Corps of the Army, or the gas masks required by the Chemical Warfare Service.

In addition to the Government specifications for rubber products, there are many nationally recognized standards, specifications, and methods of test which have been prepared by technical societies and trade associations.

All these specifications have been rendered available in convenient form in the new, revised edition of the National Directory of Commodity Specifications compiled by the Division of Specifications and recently issued by the Bureau of Standards. In this directory each standard or specification is listed by title, designating number, and name of sponsoring organization, and is also summarized as to technical characteristics, scope and special applications. The standards and specifications for rubber products mentioned in the directory are too numerous to list in full here, there being, for example, specifications for no less than 16 different kinds of hose alone, and for 11 different kinds of druggists' rubber sundries, these having been prepared by various national technical societies, trade associations, and the Federal Specifications Board.

The use of commercial standards affords a means whereby the small purchaser may have the advantages of the specification plan of buying without the necessity of familiarizing himself with the technical details or specifications or engaging in the testing of small lots of goods which might involve a greater expense than the saving effected.

The Division of Trade Standards of the Bureau has cooperated with industry in developing and promulgating commercial standards for rubber sheeting and surgeons' gloves, the annual purchases of which by the hospitals and physicians of the country amount to nearly $5,000,000. The projects for developing these standards were initiated by the American Hospital Association in cooperation with the Rubber Manufacturers' Association. The standard for rubber sheeting calls for the same high grade of material as the Federal specification, and has been published by the Bureau of Standards under the designation, Rubber Sheeting (Hospital), CS 38-32.

The function of the Bureau of Standards in connection with these projects is that of bringing the various interests of the industry together by means of conferences and correspondence with leaders and by ascertaining the acceptability of the specifications, ultimately arrived at in conference, to the majority of the industry.

The expansion of the rubber industry during the past two decades has led to the production of a large number of varieties, sizes, and kinds of the same rubber article, and in consequence it is believed that material savings to the industry can be effected by carefully planned and intelligently directed simplification.

As in the establishment of commercial standards the Bureau of Standards acts on request from the industry and assists commercial groups in the establishment of simplified practice recommendations.

The Division of Simplified Practice cooperates with such groups to reduce waste, usually through eliminating unnecessary variety of product method, or practice. Its function is to bring together all parties interested in a project of this character and to coordinate their work in developing a simplified practice recommendation.

A simplified practice recommendation for industrial truck tires developed by the industry resulted in a substantial reduction in the sizes of these tires, which range from 9 inches to 27½ inches, outside diameter. In the dental industry and profession, a recommendation has been approved for the color and method of packaging of dental veneering and base rubber.

Testing Rubber Products for Serviceableness

"THE Testing of Rubber Goods" was the title of one of the first publications on rubber issued by the National Bureau of Standards about 20 years ago. Since that time the Bureau has maintained a position of leadership in setting standards and developing methods of test for the rubber industry.

This service has been of especial value during a period when the industry has undergone radical changes, and the consumption of rubber has increased almost tenfold, because adequate standards and test methods are required by the manufacturer as a guide to new development, and by the consumer as a means of intelligent and economical purchase.

The testing of rubber goods conducted by the Bureau of Standards is of two general types. One is a relatively simple, and often routine type of testing that is conducted to ascertain whether certain rubber products conform to the specifications set up for their purchase.

The other type of testing is broader and more fundamental, and has for its purpose a study of the composition, design, construction, and performance of rubber articles to determine how well they serve their intended purposes. Often the latter, investigational type of testing is carried out to provide an adequate basis for the preparation of specifictaions.

Virtually all of the rubber products purchased by the Federal Government are bought under specifications, as was indicated in the previous article in this series. Representative samples of a great many purchases, ranging from dredging hose to hot water bottles and from truck tires to electric cables, are tested for compliance with specifications at the Bureau of Standards. Last year about 9,000 tests were made on 1,500 different rubber articles.

The testing services of the Bureau of Standards are as freely available to the State governments as to the various branches of the Federal Government. A number of the larger states make very extensive use of such services in connection with their own purchases.

There is a popular misapprehension regarding the nature and scope of this testing of rubber products. The most frequent inquiry regarding rubber from visitors at the Bureau of Standards is: "What make of tire do your tests show to be the best " The answer is that the tests are neither designed nor conducted to place a relative rating on tires.

The Government does not test all available tires and buy the best, but rather it buys the cheapest tire offered which comes up to a given standard of quality. In the majority of cases tests are made only on the tires supplied by the lowest bidder, and furthermore, such tests are conducted only to such a point as to ascertain that the tires conform to the minimum requirements of the specification. Except in the case of the rejection of the lowest bid, no tests are made on the tires of the next highest bidder.

While the testing of rubber products under specifications is done for the specific purpose of insuring the quality of purchases by the Federal and State governments, there are certain definite benefits which accure to the industry. This testing aids in the maintenance of uniform test methods and procedures throughout the industry—a service which is especially needed in the case of rubber because of the technical difficulties involved in testing.

Another benefit is the setting up and maintenance of standards for rubber products which frequently find wide acceptance. For example, the commercial standard for hospital rubber sheeting recently adopted by the industry is identical with the Federal specification for the same commodity.

Investigational Testing of Rubber Goods

INVESTIGATIONAL testing is different in character from specification testing which was described in a previous article, and sometimes involves detailed investigations and scientific studies of rubber products.

One illustration of this type of testing is the study that was made on the subject, "The Wearing Quality of Tire Treads as Influenced by Reclaimed Rubber." This investigation was conducted in 1925 when the price of new rubber was high and was subject to wide fluctuations.

At this time reclaimed rubber was used in tires to quite a large extent and many manufacturers claimed that it could be employed in reasonable proportions as satisfactorily as new rubber. As a matter of fact, some laboratory abrasion tests indicated that this was the case.

The investigators of the Bureau of Standards, however, recognized that the laboratory abrasion tests then available were frequently not in accord with road tests. So they secured the cooperation of a manufacturer who built a number of tires in which the treads were made up of sectors containing varying proportions of reclaimed rubber.

Performance tests on these tires showed that the rate of tread wear was increased directly in proportion to the percentage of reclaimed rubber used. The logical conclusion from this finding was that the use of reclaimed rubber in tire treads was of no economic advantage.

This conclusion did not find immediate acceptance, but was for a time the subject of discussion and controversy. The situation was recently summed up in a paper by C. W. Sanderson, of the Goodyear Tire nad Rubber Company, which was published in *Industrial and Engineering Chemistry*, vol. 23, pp. 989-991, September, 1931. This author states, in part:

"Therefore, it can be said that, up to 20 per cent, the use of reclaim will cut down the resistance to road wear by approximately the percentage used. This is essentially the conclusion reached by Holt and Wormley (authors of the Bureau of Standards paper). Their method was severely criticised, but this criticism was not justified, and their conclusion was essentially in line with the facts."

Partially as a result of this investigation, the practice of using reclaimed rubber in the tread of tires has been very largely discontinued, and the saving to the motorists of the country as a result of increased tire mileage is very material.

Other tests of this type will be mentioned briefly to indicate the varied scope and application of this type of work.

A study was made of the rubber balloons used by the Weather Bureau to determine the height of the ceiling at flying fields and the velocity and direction of the winds aloft. The results of these tests were employed to draw up specifications to permit the purchase of more serviceable and more reliable balloons.

A series of tests on the lateral movement of the tread of a tire as it comes in contact with the road were of especial interest to designers of automobile tires, and the results published were used by some manufacturers as the basis for redesigning their tread.

In answer to numerous requests for information on puncture-sealing compounds, tests were conducted on the different types of commercial preparations available. The results were published in a circular which has had wide distribution.

Tests that were made on garden hose were published in a circular entitled, "Selection and Care of Garden Hose." This publication tells the householder how to make an intelligent selection of hose without undertaking any laboratory tests, and also gives timely advice on the proper care of hose.

The Bureau of Standards through its varied activities in the testing of rubber benefits the Federal and State governments as purchasers, maintains standards for the industry, and furnishes accurate and reliable information which is of value to the manufacturer and the public.

LATEX PROCESSED ROPE

New Type of Cordage Claimed to Possess Better Waterproofing Qualities and Reduction in Wear Through Improved Lubrication of the Fibers—Vulcanization of the Rope Does Not Destroy Proper Flexing Properties

IN the manufacture of rope and cordage the customary practice is to assemble the fibers in the form of yarns or slivers and these yarns or slivers are formed into the rope and cordage by twisting or laying operations. In some few instances, the slivers are enclosed in covering layers to form either a completed rope or a member of a completed rope. In all instances, it is customary to supply the rope or cordage when designed for a large class of uses with a lubricating material or a lubricating and preservative material, the object being to prolong the life of the fiber when the rope or cordage is subjected to heavy use as well as to preserve the same against deterioration or injury through fungoid or bacterial action. Unfortunately, however, practice has demonstrated that, with all material so far added to the fiber in the structure of the rope or cordage, it has been practically impossible to maintain effective waterproof conditions or to retain the lubricant, no matter whether it be an oil, a graphite or similar substance, at the center of the rope or cordage. Consequently, after considerable use, this added material which is quite effective when the rope or cordage is new, works out and is lost, whereupon the rope begins to deteriorate through any one or all of the causes which ultimately results in its destruction. A new patent recently granted (U. S. Patent No. 1,812,354) claims to overcome these difficulties.

Advantages of Latex Rope

The object of the new invention is to incorporate in a rope a material which will, in a large measure, overcome the difficulties heretofore experienced, and in addition impart to the rope or cordage those qualities which have heretofore been believed to be unattainable. Some of the advantages gained by the present invention, is a more effective waterproofing of the rope or cordage; a reduction of the wear on the fibers under load by improving the lubricating qualities of the filler; the ability to combine the individual fibers for greater strength and wear resistance, to prevent fuzziness, to do away with the necessity of twisting to the degree which has heretofore been deemed necessary in both these classes of cordage making use of slivers as distinguished from yarns, as well as where yarns are employed. In other words, the present invention contemplates the provision of means for holding the fibers in proper relation with respect to each other and in a more or less substantially straight condition, more nearly parallel with the axis of the rope or cordage, thereby eliminating the imposition of what is termed cross strains on the fibers so as to avoid the cutting of the fibers which action, as will be appreciated, reduces the strength of the rope or cordage very materially.

The invention contemplates the construction of a rope wherein the fibers may be untwisted or only slightly twisted, twisting of the fibers having the effect of placing a cross strain on them and thereby reducing their tensile strength. Preferably these several objects can be accomplished by forming the rope with the untwisted or slightly twisted fibers or all the yarns embedded in a vulcanizing compound, the fibers or yarns all extending parallel to each other and to the longitudinal axis of the finished product or taking approximately the twist of the formed strand.

In order to further increase the life of the rope the fibers thereof, in addition to being joined or cemented together by the vulcanizable compound, may also be protected from chafing or rubbing by having the exterior surfaces of the elements constituting the rope provided with a protective covering of the vulcanized material. Such covering is not necessary or essential in all classes of ropes but where rope is to be used under circumstances such as would cause it to come into contact with objects, as in the the case of drilling cable, hoisting ropes, and the like, the use of a protective covering of vulcanizing material is highly beneficial so far as the rubbing or chafing of the fibers is concerned.

Method of Incorporating the Latex

One method of incorporating the solution or compound in the rope consists in passing one or more slivers or yarns which are entered into the formation of the rope through such solution or the solution is poured on the yarns or slivers on their way to spinning, forming or laying machines, the number of yarns or slivers treated with the solution, and the size thereof, naturally controlling the quantity carried into the rope. The yarns or slivers carrying the solution with them are passed into the spinning or forming or laying machines preferably more or less centrally of the remaining yarns or slivers and, due to the pressure and working in the ordinary spinning or forming or laying machines, it is found that the compound or solution distributes itself in a practically uniform manner throughout the whole rope or cordage. The proportions of the various ingredients used in the solution will, of course, vary depending upon the characteristics desired to be imparted to the finished rope. For instance, if it is desired to have the rope highly lubricated, so to speak, the cordage or rope could contain as high as twelve per cent of cordage oil; one-half of one per cent sulphur; six per cent of rubber latex; two-tenths of one per cent zinc oxide and four-hundredths of one per cent of an accelerator such as hexamethylene tetramine. On the other hand, if it is not desired to have such a high percentage of lubricant in the finished rope the quantity of cordage oil may be decreased to any desired extent or some of the colloids mentioned, other than rubber latex, may be utilized in the solution.

The vulcanization results in binding the fibers together, but at the same time the elastic characteristics of the binding agent permits of the necessary flexing of the rope or cordage, or, in other words, the relative movement of the fibers without causing disruption of the fibers themselves. At the same time there is little or no tendency of the binding agent to work out from between the fibers, so that

even after long and heavy work the interior of a rope remains in condition to bear its proportion of strain and there will be found but little, if any, evidence of pulverization, such as ordinarily occurs. In fact, it has been found that in well cables, even when a "draw" occurs, the effect of wear on the projecting portions of the cable does not result in so rapid disintegration as ordinarily sets in, because of the fact that the remaining parts of the worn fibers are bound together and held in place, while the other fibers are bound together and held in place.

In certain classes of cordage, particularly small cordage or twines to which a covering of starch is applied, it is found that the use of a rubber-like compound is of material advantage in that it maintains the softness and flexibility without imparting the ability of the cordage to retain the starch coating, and in all instances it is found that the color and appearance of the cordage is not materially affected, unless the vulcanizing temperature be carried too high. Therefore, it may be desirable in some instances to use one of the so-called cold vulcanizing processes, especially if it is desired to initially vulcanize only that portion of the compound binding the fibers together near the surface of the cordage.

When the rope is made up of slivers, the fibers are substantially parallel and preferably substantially without twist, the vulcanized elastic colloid serving to hold the fibers in form, but, of course, a plurality of slivers may be combined and each sliver may have a wear resisting covering if so desired, as in known classes of rope.

Plastogen

A THERMO-PLASTICIZING agent called Plastogen, which eliminates the breaking-down of rubber, and which is intended for use as a saver of time and power in the mill-room is being offered by the R. T. Vanderbilt Company, New York City.

Plastogen is a non-toxic, non-corrosive, pleasant smelling, oily liquid, straw-colored in bulk, but almost water-white in thin films. It has practically no tinctorial power. Specific gravity is 0.83 (7 lbs. to the gallon).

Plastogen has no effect on the rate of cure or on the aging properties of compounds. It does not bloom out and prevents to a considerable extent the blooming of other materials such as antioxidants, and helps eliminate scorching.

The best method af adding Plastogen to a rubber mix is the simple, direct method of adding it all at once to the unmasticated crude as soon as the latter is in the Banbury, or dribbling it on the open mill, and before any pigments are added.

Another method of adding the Plastogen is to add a portion, say ¼ or ½ at the beginning and the remainder with or after the powders. Still another method of incorporation is to add it in the form of a masterbatch, say 1 of Plastogen to 2 of rubber. If desired the master batch may be made by soaking rubber in Plastogen.

To derive the full benefit from the use of Plastogen, i.e., the substantial saving in power consumed, length of time of mixing, and lower temperature of mixing, the material should be added immediately at the beginning of the mixing operation, and to unmasticated rubber. The amount of Plastogen recommended is from 4 to 8 per cent by weight on the rubber.

The following advantages are claimed for Plastogen: It eliminates premastication and reduces power consumption in mixing and processing. It shortens time of mixing, lowers average temperature of mixing, and allows sulfur to be added in the Banbury without scorching. It brings uniformity into warming up, calendering and extruding operations. It maintains or improves the physical quality of compounds.

Standardized Hospital Sheeting

THE American Hospital Association, through John M. Smith, chairman of its Standardization and Simplification Committee, requested the cooperation of the Bureau of Standards in the establishment of a commercial standard for rubber sheeting under date of February 23, 1931. Following the formulation of a tentative standard by the American Hospital Association, the assistance of the Rubber Manufacturers Association was requested by the Bureau of Standards to ascertain the desires of manufacturers concerning the requirements of the specification.

The Rubber Manufacturers Association then circulated the tentative draft to all manufacturers known to it and discussed the specification in a meeting of manufacturers. Following the approval of the standard with some minor changes, the Rubber Manufacturers Association suggested that a general conference was unnecessary and requested the Bureau of Standards to dispense with this item of its procedure. The Bureau of Standards referred this request to the Standardization and Simplification Committee of the American Hospital Association and with its approval circulated the following recommended commercial standard to the industry for acceptance.

The sheeting shall be made from a cotton fabric coated on one or both sides, as specified, with a rubber compound containing not less than 30 per cent by weight of best quality, new, wild, or plantation rubber. It shall have a smooth, uniform, soft finish, free from pits or other imperfections. The material shall be rubber coated to the full width specified. The finished sheeting shall be of maroon, white or cream white color. The finished sheeting shall be in 36, 45, or 54-inch widths. The tensile strength shall be not less than 50 pounds, warp and filling, and tests shall be made within 30 days from date of delivery by the grab method with 1-inch jaws, 3 inches apart, at a speed of 12 inches per minute.

A standing committee was suggested by the Rubber Manufacturers Association and the American Hospital Association to represent the various branches of the industry and to receive all comments and suggestions for the improvement of the commercial standard.

The membership of the standing committee is as follows:

John F. Bush (chairman), superintendent, Presbyterian Hospital, New York, N. Y.

Dr. Joseph B. Howland, director, Peter Bent Brigham Hospital, Boston, Mass.

John M. Smith, director, Hahnemann Hospital, Philadelphia, Pa.

T. Woythaler, Hodgman Rubber Company, Framingham, Mass.

A. F. Schildhauer, E. I. du Pont de Nemours Company, Newburgh, N. Y.

J. H. Mason, Haartz-Mason-Grower, Watertown, Mass.

E. Burnell Rhoads, Rhoads & Co., Philadelphia, Pa.

William A. Gately, Hospital Bureau of Standards and Supplies, New York, N. Y.

F. W. Reynolds, ex-officio secretary, Bureau of Standards, Washington, D. C.

Dioxan

DIOXAN (diethylene oxide) is a saturated, cyclic hydrocarbon containing two ether groups. It is completely soluble in water, as well as in hydrocarbons and organic solvents. It is neutral, stable, and is unaffected by acids or alkalies. It is highly polar, solvent for certain metallic nitrates and chlorides, as well as for cellulose, natural and synthetic resins (including rubber), vegetable and mineral oils, certain waxes and dyes.

Its physical properties are: Boiling point, 101° C.; Melting point, 11° C.; Density (20° C.), 1.03; Viscosity (20° C.), .011; Vapor pressure (20° C.), 29 mm.; Colorless and practically odorless. (Carbide and Carbon Chemicals Corporation, New York City).

EDITORIAL COMMENT

Rounding the Corner

EVIDENCE appears to come from the rubber industry that the rock bottom of the depression has been reached. We have heard much about prosperity being "just around the corner," but over the period of the last two years the corners have had their sharp edges much battered and the footsteps of the industry have progressed more in bewildering circles.

But within the last thirty days we have seen some definitely hopeful signs injected into the picture. One of the leading Akron companies has advanced the salaries of their employes twenty per cent to cover a corresponding reduction made last January. One of the "Big Five" tire companies has reported a net profit for the first six months of their fiscal year of a million and a half dollars.

Reports from the Akron district indicate that more employment is being offered in the rubber mills than at any time during the past year. The consumption of crude rubber during June totaled over thirty-nine thousand tons, an increase of thirty-four per cent over the preceding month and indicated a higher absorption of rubber than for any month for the past two years. This increase in rubber consumption must necessarily reflect increased production in tires, mechanical goods, rubber sundries, and other miscellaneous rubber products and is conclusive proof that some advance in the industrial activity has been made. It is hoped that this increase in production can be sustained. Reports in other industries also indicate a similar slight advance in factory activities.

With increased employment, even ever so slight, purchasing power is increased, and in the last analysis it is the purchasing power of the average individual which is going to be the index to an advance or further decline in this depression period.

The latest signs give some hope that this "rounding of the corner" is no longer an idle myth.

False Economy vs. Safety

THE present depression with its economies and slashings in skilled personnel has apparently made itself felt in the score of human killings and bodily injuries. The final report for the past year of the National Safety Council shows clearly that injuries and fatalities have increased in all branches of industry. The report on the rubber industry has been published elsewhere in this issue.

Although in point of frequency injuries have decreased, serious and fatal accidents have increased. This can be attributed in part to the reduction in skilled labor or a laxity in the administration of Safety measures. Many foremen and other employes, schooled by long years of experience in the application of safety measures and capable of drilling workers in those measures, have been laid off. This has put the task up to men comparatively green and so practically nullifying the benefits of factory safety councils and safety meetings.

Another reason for many of these accidents can also be laid at the door of depression and the measures for economy it has brought forth. In slashing costs industry has in many cases retained old and defective equipment, which at once constitutes a hazard to personal safety. In many other cases when new equipment is installed, safety devices other than those which are an integral part of the machinery itself, have been omitted for the obvious reasons of economy.

In these times of depression it is false economy to go too far with drastic cuts in skilled labor, experienced factory supervisors and foremen, and a let-down in the safety program. Old machinery becomes soon a safety hazard and replacements may save much in employes compensation payments.

It is hoped that the return to better times will see the accident rates in the industry return to lower levels.

Credit for Raw Materials

AS WE go to press it is reported that the Reconstruction Finance Corporation, at a meeting held August 4, discussed plans for extending credit to industrial concerns for the purpose of taking advantage of present low commodity prices. Rubber manufacturers in particular might be great beneficiaries under this plan if they take advantage of it, as both rubber and cotton are at extremely low levels and any appreciable stocks of these commodities, which might be accumulated at present prices would reflect very favorably in inventory values when higher levels are reached. It is hoped that full advantage can be taken of this credit accommodation by both large and small manufacturers in the industry.

The RUBBER AGE

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THE RUBBER AGE is indexed in *Industrial Arts Index*

The Rubber Industry's CURRENT NEWS

Financial—Personals—New Rubber Products—
Building Operations—Manufacturing—Exports

PRICE OF RUBBER CONTINUES TO ADVANCE

The gradual strengthening of the prices of raw rubber has been one of the most encouraging features of raw materials field, according to E. G. Holt, chief of the rubber division of the Commerce Department.

At the close of July the price of raw rubber stood at 3.12 cents per pound in comparison to prices of 2.78 cents on July 15, 2.68 cents on July 8 and 2.62 on June 18. The lowest rubber quotation of the year occurred on June 9 and 10 when the price stood at 2.56 cents per pound.

Indications of further reduced production on plantations in the Middle East, and the sudden discovery that stocks of rubber in Singapore June 30 were 18,000 tons lower than originally reported Mr. Holt points out have contributed to the advance in the price of crude rubber, rather than definite signs of increased rubber consumption, although United States June consumption figures as announced were much above trade anticipations.

Consumption of crude rubber by manufacturers in the United States for the month of June amounted to 39,116 long tons, as compared with 29,197 long tons for May, 1932, and represents an increase of 34 per cent. This is the highest consumption for any one month since May, 1930, according to statistics released by the Rubber Manufacturers' Association recently.

Fisk Reorganization Plans

Having received strong assurances of support from owners of the 8% bonds and 5½% notes of the Fisk Rubber Company, now in receivership, the Chicopee Chamber of Commerce protective committee for these securities is considering a reorganization plan.

Whitfield Reid, secretary, stated many bonds and notes already have been received since the committee's call for deposits two weeks ago, and it has been informed it will receive certificates of deposit representing securities pledged with other Fisk protective committees.

Mr. Reid explained that deposits made with the original Fisk reorganization committee under a plan and agreement dated January 25, 1932, will be available for withdrawal since that plan failed of adoption.

The Chicopee committee is financed entirely by the Chamber of Commerce and note and bond holders may deposit and withdraw without cost. It seeks an immediate reorganization of the Fisk company so as to best preserve the remaining equity.

Biggest Tire Explodes

While being on exhibit at one of the new tire service stations of the Goodyear Tire and Rubber Company in Cleveland, O., what was reputed to be the largest tire ever manufactured blew up with a detonation which rocked the immediate neighborhood.

The tire measured 46 inches by 12 feet and was mounted on a pedestal in front of the new station and was revolved by a miniature motor. It is believed that the strong sun beating down on it raised the air pressure and thus caused the greatest blowout in history.

BRITISH CARS HAVE RUBBER ENGINE MOUNTS

Announcements as to next year's cars are now appearing in Great Britain. The program of the Rover Company calls for the adoption of rubber engine mounting. Other big manufacturers, it is expected, will follow suit and announce this feature. Flexible engine mountings will be one of the leading improvements of British 1933 models.

Rubber to Buffalo via Water

An experiment in the shipment of rubber direct from Singapore to Buffalo and thence to Canada, by water was completed with apparent success during last month. The Woodstock Rubber Company of Woodstock, Ont., shipped the rubber from Singapore to New York and thence by barge canal to Fort Erie, opposite here on the Canadian side of the border. Trucks concluded the journey to Woodstock. Officials of the company are now figuring the net cost of the shipment and if the saving is as great as is evident a large volume of trade may be handled in this manner for Canadian tire and other rubber works.

Firestone Votes Dividend

Directors of the Firestone Tire and Rubber Company, at a recent meeting declared the regular quarterly dividend on preferred stock. The dividend payment is to be $1.50 per share on 600,000 outstanding shares of series A of the preferred issue.

Every Firestone employee owns one or more shares of preferred based on the company's plan of purchase. The stock carries a 6 per cent clause.

Payment is to be made Sept. 1 to stockholders of record as of Aug. 15.

GOODRICH OFFERS AID TO COTTON GROWERS

Martha Mills, textile division of the B. F. Goodrich Company, Silvertown, Georgia, has notified its cotton shippers that from now until July 31 of next year the company will pay for seven pounds of additional cotton per bale at the current cotton price if the bales received are 100 per cent cotton wrapped.

The Goodrich mill uses approximately 73,000 bales of cotton annually to produce 30,000,000 pounds of Weftless Cord for Goodrich tires.

"The seriousness of the cotton situation at the present time has prompted this action," it was said by Albert T. Matthews, vice-president and general manager of the Goodrich mills. "Because of the large carryover and the present price which is below production cost, we feel that it is necessary to promote the increased use of cotton, particularly as applied to the cotton industry."

It is believed that such action will stimulate similar action by other companies affiliated with the cotton industry and that some relief from the present situation will prevail.

Rubber Stocks Show Gains

Rubber stocks listed on the New York exchange, with but one exception, were in step with the general advance in prices at the end of July.

Goodyear common was the lone issue to reveal weight in trading and after having reached a high of 12½, slid down to 11¾ for a loss of ¼. The preferred, however, was buoyant, and closed at 38¼, a gain of 1¼.

Goodrich common advanced to 4¾ for a gain of ¾. The company's preferred was up 2 points at 13. Firestone common shaded upward to 12 for a ½ gain and its preferred marked up a ¾ advance to close at 50¾.

On the Cleveland exchange, Firestone preferred did not do so well, losing ⅛. General was off 2 points at 18. Seiberling was up ½ point at 2.

N. J. Association Has Outing

Members of the Rubber Manufacturers' Association of New Jersey recently held an outing and dinner at the Trenton Country Club. Practically all concerns affiliated with the association were represented. Following the dinner the day was devoted to golf. John A. Lambert, treasurer of the Acme Rubber Manufacturing Company, Trenton, is president of the association.

SINGAPORE STOCKS ERRONEOUSLY REPORTED

Advices received by the Department of Commerce, from Trade Commissioner Williams, Singapore, state the amount of rubber held by dealers there, which is officially reported monthly by the Government authorities, has been erroneously reported each month for a period perhaps extending back to September, 1929. It appears that the statistics reported by the authorities have been calculated on the basis of monthly receipts and deliveries in connection with the stocks reported as being on hand at the end of the preceding month, but that monthly deliveries have been underestimated. The result is a large cumulative error in Singapore rubber stocks, and the June 30 stocks as revised are now reported as 16,214 long tons against an original figure of 34,391 tons, a reduction of 18,177 long tons.

The discovery of this reported discrepancy comes at a time when world stocks of rubber are so high that the sudden disappearance of 18,000 tons has a practically negligible market effect. If such a discovery had been made in a time when supplies were already low, as in 1925 when the price was over a dollar a pound, the effect would certainly have been to skyrocket prices. Even under present conditions, the discovery can be interpreted only as constructive news from a market viewpoint.

New Rubber Exchange Members

The board of governors of the Rubber Exchange of New York, Inc., has elected the following to membership in the exchange: Irvin King, 123 S. Broad Street, Philadelphia, manager of the Philadelphia office of Munds, Winslow and Potter; Poncet Davis, 204 Ohio Building, Akron, Ohio, identified with the cotton tire fabric industry; and James E. Odell, Jr., 25 Broad Street, New York City, N. Y., crude rubber broker.

Goodyear's First Head

In the recently published obituaries following the death of R. E. Penfield, on July 11, it was generally conceded that he was the first president of the Goodyear Tire and Rubber Company. It now appears, from notices in the *Wingfoot Clan*, the house organ of the Goodyear company, that he was the second president, having succeeded David E. Hill, who served less than a year between 1898-99.

1933 Chemical Show

The fourteenth Exposition of Chemical Industries, better known as the next Chemical Show, will be held in New York during the week of February 27th to March 4th, 1933. Grand Central Palace will again be the location and three entire floors will be devoted to the exhibits showing the newest developments in raw materials, machinery, and manufactured products. Already, at this early date, more than 179 companies have reserved space. The exhibitors represent over forty American industries which are classified as chemical.

The last exposition, which was held in 1931, was attended by 103,000 and more than 22,000 registered. Not only is the exposition invaluable to members of the chemical industry but it is also one of the most interesting shows which the business man is priviliged to visit. Admission will be without charge, and by invitation or by registration only. No tickets will be sold.

Commercial Rubber Co.

The Commercial Rubber Company, 47 Ridgehurst Avenue, West Orange, N. J., has been incorporated at Trenton with $125,000 capital to manufacture various kinds of rubber goods. Lawrence L. M. Barnhart, of Newark, is president of the company.

WORK ON U. S. S. MACON DELAYED BY CONGRESS

With the failure of Congress to act favorably on the merchant-airship bill the Goodyear-Zeppelin Corporation is using a reduced working force on the *U.S.S. Macon* and the plans of having her completed by mid-winter have practically been abandoned. The nucleous organization at present working will be held together as long as possible.

At present the Macon's construction is in an advanced stage. Completion of her framework took place with public ceremony July 4.

Five bays of the Macon have been covered. These make up 260 feet or a little more than a third of the structure.

Two of the eight engine rooms are completed, and the others are being worked on. Three of the 560-horsepower Maybach motors, built in Germany, have arrived. Gear arrangements on the first of these are being tested on the large test block in back of the Goodyear-Zeppelin plant.

The framework of the top and port fins is nearing completion. It will be covered before it is raised into position.

Work on the control car is under way and some of the fuel tanks are already in position.

Marketing Johnson Machines

The New England Butt Company, Providence, R. I., are now marketing the Johnson super-production tubing and straining machines. They are the sole manufacturers of these machines under the Johnson patents, up to and including 3¾-inch worm. The company has long been a supplier of rubber machinery to the industry and has specialized in the manufacturing of rubber strip covering machines, rubber hose braiders and spreading machines.

Goodyear on Four-Day Schedule

Goodyear Tire and Rubber Company, at its Akron plants, is back on a six-hour day, four-day a week schedule. This reflects a let-up after the rush of production incidental to the Federal tax on tires and tubes.

Better Compounding Urged in *Vanderbilt News*

THE current issue of *Vanderbilt News* is devoted largely toward improved compounding and better rubber goods. Superaging Rubber Compounds is the title of the leading article which, in addition to telling what these compounds are and how they are made, discusses the production of rubber goods of greatly increased stability and usefulness.

In the early days of rubber manufacture, the article states, from 6 to 15 per cent of sulfur was used and a long cure was given. Articles vulcanized in this way oxidized rapidly and retained their elastic properties but a short time. The advent of organic accelerators in 1907, and later antioxidants, made possible lower sulfur ratios and shorter periods of vulcanization with longer useful life of the vulcanized product. Great as have been the advances in rubber compounding by the use of accelerators and antioxidants, it is felt that present methods of vulcanization are capable of further improvement.

The suggestion is then made, that in keeping with the vulcanization theory of Boggs and Blake, a stock compounded with tetramethyl-thiuram disulfide (Tuads) produces at ordinary temperatures well vulcanized rubber products which are extremely resistant to oxygen and heat and are far superior to those obtained by the use of sulfur in the customary percentages (3 to 6%). They are, however, soft, low modulus stocks and it is recommended that secondary vulcanizing agents, such as selenium or tellurium, be used with minimum amounts of sulfur (.5—1.2%) to produce "Superaging" stocks with a wide range of desirable properties.

The balance of the article discusses the advantages of such superaging compounds, with their various properties such as resistance to oxygen, heat, and discoloration; physical properties; air bomb and oxygen tests, etc. A large number of charts and tables illustrate the properties of various types of stocks using old and modern materials.

Rubber Stock Quotations

	Last Price Aug. 5	July 19	—1932— High	Low
Aetna	1¾	1½	3	1½
American Hard Rubber	—	—	—	—
Faultless	20	18½	25	12
Firestone	12	—	15	10¾
do. 6% pfd.	55	47	59½	45½
Fisk	¼	⅛	⅜	⅛
do. 1st pfd.	—	—	⅞	¼
General	30	40	45	25
do. pfd.	60	60	—	—
Goodrich	4¾	—	5⅝	2¼
do. pfd.	13¼	8	17	7
Goodyear	12⅝	8¼	18¾	5½
do. 1st pfd.	42	—	61	19¾
India	2⅜	1¾	7	½
Kelly-Springfield	1¼	—	2⅞	½
do. 6% pfd.	—	10	30	16
Lee	—	—	2¼	2
Mohawk	1½	1¼	2½	1
do. pfd.	20	20	—	—
Norwalk	—	—	—	—
Pirelli	—	—	31¾	21
Raybestos-Manhattan	7	5	11½	4⅞
Seiberling	2¼	1	4½	1
do. pfd.	10	7	22	7
Thermoid	1⅞	1	3	⅞
U. S. Rubber	4½	2½	5⅜	1¼
do. pfd.	8⅞	5	11½	3¾

JUNE CRUDE RUBBER PRODUCTION LESS

Rubber production on estates of small type in British Malaya amounted to 11,182 tons during June, as compared with 14,079 tons during May, and with 16,663 tons during June, 1931.

The production decrease on large estates was less marked, the total for June being 19,519 tons, against 19,915 tons in May, and 19,014 tons during June, 1931, according to results of the monthly census cabled to the Rubber Exchange of New York.

Rubber stocks on estates at the end of last month, dry basis, totaled 21,053 tons, showing little change from May when the figures were 21,339 tons, but were moderately less than June, 1931, when these supplies amounted to 22,101 tons.

Dealers' stocks aggregated 22,941 tons at the close of June, as compared with 24,083 tons at the end of May, and with 19,948 tons at the end of June, 1931.

In addition to the British growing territories of Malaya and Ceylon, smaller rubber shipments also were reported for the Netherlands East Indies during the month of June. The latter shipped out 18,932 tons of crude rubber last month, as compared with 19,422 tons during May, and with 24,317 tons in June, 1931.

Superflax Tire Company

The former plant of the National Tire Company, East Palestine, O., which was recently taken over by a new organization to be known as the Superflax Tire Company, is expected to start into production shortly. The plant, which has been closed for five years, has been equipped with new machinery. It is expected that the factory will begin operations with about fifty employes.

I. F. Wiltsie of Babylon, L. I., and Harold Howenstein of Canton, O., conducted negotiations whereby the new company took over the plant.

Sterling Plant Remodeled

The Sterling tire plant in East Rutherford, N. J., closed for two years, is being rebuilt, remodeled and will soon begin the manufacture of tires.

The Sterling Corporation owns land and buildings, but a lease has been given Harry Shaw of Akron O., who is having the plant remodeled. It is believed that Mr. Shaw represents a number of interests in Akron.

Lomax Littlejohn Will

The will of Lomax Littlejohn, president of Littlejohn and Company, commission merchants and rubber brokers, of 133 Front Street, New York, N. Y., disposes of an estate valued at "more than $10,000" but estimated to be at least $500,000, to his sons and other relatives, with several large bequests to hospitals and homes for the aged. Mr. Littlejohn died at his home, 144-15 Sanford Avenue, Flushing, L. I., on July 10. The institutions named beneficiaries in the will are the Trudeau Sanitarium of New York. the Flushing Hospital, St. Luke's Home for Aged Women and the Home for Old Men and Aged Couples, all of New York.

Names in the News

M. F. DAVIS, sales supervisor of the B. F. Goodrich Company in the Michigan territory, has also been appointed advertising manager in that district.

G. T. GRAHAM, vice-president of B. F. Goodrich Company, recently held a series of conferences with officials at the Martha Mills, Silvertown, Ga., the fabric making subsidiary of the Goodrich company. Martha Mills recently announced a new policy of paying for seven additional pounds of cotton per bale if the bale was entirely wrapped in cotton, as a stimulus to increase the use of the product.

NOAH VAN CLEEF, of the firm of Van Cleef Brothers, Chicago, Ill., has recently returned from an extensive European business trip. Mr. Van Cleef visited the sales representatives of his firm in London, Amsterdam, Brussels, Paris, Genoa, Turin, Munich, Prague, Copenhagen, Stockholm and Oslo, for the purpose of acquainting them with the new products and assisting them in combatting present business conditions, which everyone realizes are world wide.

J. F. "JACK" O'BRIEN, general foreman of the mechanical finished goods warehouse of the B. F. Goodrich Company, Akrno, O., was recently stricken ill and is in St. Thomas Hospital, Akron.

H. J. CARROLL, O. C. PAHLINE and G. A. WADDLE of the Goodyear Tire & Rubber Company, Akron, were guests of the New York Shipbuilding Company on a trial trip of the "Manhattan," the world's largest liner, Saturday.

THOMAS F. CALLAHAN, 200 North Adolph Avenue, who received his bachelor of chemical engineering degree at Catholic University, Washington, D. C., in June, will leave about August 1 for Borger, Texas, where he will start work in the research laboratories of the Palmer Carbon Company. Mr. Callahan worked in the Goodrich research labortories several years after his graduation from St. Vincent's high school and also during the summer vacations when he was attending Catholic University. The company which he will serve is one of the major producers of gas black. an ingredient widely used in rubber manufacture.

Mr. Callahan's father, THOMAS B. CALLAHAN, served Goodrich more than 20 years and on retirement, was foreman of the tin shop.

F. A. MEURIN, *Dallas*, Texas, southwestern division sales manager for the B. F. Goodrich Company, was in Akron, Monday, July 18, to confer with company officials. He came to Akron with E. A. DOERSCHUK, manager of the credit department, who returned from the southwest.

FRANK E. TITUS, former Akron resident and now sales manager of the Pacific division of the B. F. Goodrich Company, has completed 25 years continuous service with Goodrich. When in Akron, Titus was vice-president of the Goodrich export company.

ROBERT J. STOKES, of Princeton, N. J., president of the Thermoid Rubber Company, Trenton, N. J., spent the month of July with his family at their summer home along the Massachusetts coast.

JOHN W. REED, of Asheville, N. C., southern representative of the Mercer Rubber Company, Hamilton Square, N. J., has been spending some time at the factory. Mr. Reed is the son of I. Ely Reed, treasurer of the Mercer company.

G. M. SPROWLS, manager of the highway transportation department of Goodyear Tire and Rubber Company, has been presented with a service pin in recognition of 20 years of service with Goodyear. The award was made by B. Darrow, manager of the development department.

B. E. DOUGHERTY, for the past three and a half years the vice-president and general manager of the C. P. Hall Company of California, has resigned to organize his own concern, the B. E. Dougherty Company. The new company is located at 1807 E. Ninth Street, Los Angeles, Cal. The company will represent, as agents to the industry in southern California, Godfrey L. Cabot, Inc., on carbon black, E. W. Colledge, GSA., Inc., companies, and several other manufacturers of rubber chemicals.

Sir John Ferguson

Sir John Ferguson, chairman of the Palmer Tire, Ltd., and member of Parliament for Twickenham, died at Southborough, England, recently, at the age of 62. Although well-known in the tire world, Sir John was best known in banking circles. He was born at Monymusk, Scotland, and at the age of 16 he entered the service of the Town & County Bank, Inverurie. Soon after he joined the National Bank of Scotland and spent 13 years at its head office. In 1903 he was transferred to London, becoming manager in 1911. When this bank was affiliated with Lloyds Bank, a step for which he had long worked, he was appointed joint general manager.

In the war his friend, Lord Inverforth, who had become Surveyor-General of Supplies at the War Office, called upon him for help, and he eventually became chairman or member of no fewer than 15 committees. He was president of the Institute of Bankers, 1925-27, and was regarded before the war as one of the ablest of the younger generation of bankers. His experience during the war added to his reputation.

Rubber News Around the World

CZECHO TIRE TRADE SHOWS BIG INCREASE

The most important event affecting tire sales in Czechoslovakia during recent months was the commencement of tire production by the Kudrnac Rubber Company, Nachod, with five passenger sizes and one truck size, to be followed within a short time by other sizes. At present, total output, is about 50 casings per day, but plans call for a daily capacity of 300 per day by the end of the year.

This company sells direct to the retail trade and through dealers located mainly in the territory surrounding its factory. However, it is just a question of time until the company's sales organization will cover the country.

The Kudrnac company has agreed to maintain prices at the same level as the Matador company, and has issued a price list corresponding to Matador's—that is, 10 per cent below the prices quoted by distributors representing foreign companies.

It is reported that Kudrnac has received substantial original equipment orders from the Skoda and Praga automobile companies, and it is thought that Kudrnac will receive the full support of the Government and will eventually get the bulk of Government orders for tires, as the only other important domestic producer (Matador) is a branch of the Austrian Semperit Company.

The Matador factory has increased production and is now turning out about 300 casings per day. For several months it has been getting most of the original equipment business for passenger cars produced in the country. Lately this company has been paying more attention to the truck line, and recently received a substantial order for truck tires from the Praga company. The Matador tires for passenger cars—especially the smaller sizes—give satisfactory service, but it is still too soon to know how its truck tires will hold up.

Bata Producing Tires

Bata tires have now appeared on the market, the company producing two sizes of truck casings and tubes in the Zlin factory and distributing them through their retail shoe stores.

Tire importers and the local Matador company are seriously concerned over the prospect of having Bata for a competitor, because the concern has resources for producing on a large scale, if they really decide to go into the business whole-heartedly. With 1,960 retail shoe stores located in all parts of the country, they would be enabled to distribute tires at very little expense.

Owing to pending import restrictions on tires, importers increased their stocks during the fourth quarter of last year, and they are still higher than normal. The decline in consumption and sales also tended to increase stocks. It is believed that about a four months' supply is now being carried by distributors.

With the number of commercial vehicles and passenger cars in use relatively declining, and the increasing domestic production of tires, the outlook for imports seems none too rosy. The situation is further complicated by the fact that import restrictions can be made more stringent at a moment's notice by a governmental decree.

Foreign Rubber Consumption

At the end of April, 1932, foreign rubber absorption was 49.7 per cent of total world rubber absorption, compared with 45.2 per cent at the end of April, 1931. Foreign rubber absorption exceeded the United States rubber absorption in April, 1932, foreign in that month amounting to 52.0 per cent of total world. The countries taking greater amounts of crude this year than in the same period of 1931 are: Australia, Czechoslovakia, Germany, Italy, Japan, and Russia. The rate of absorption by the United Kingdom is about the same thus far in 1932 as it was in 1931.

Rubber "On the Vine"

A hybrid rubber vine which yields twice as much rubber as either of its parents has been produced by the United States Department of Agriculture near Miami, Fla. It is a cross between two plants, both native to Madagascar, one long grown in Florida as ornamental, and the other naturalized in many places in Mexico and the West Indies. The planting of Madagascar rubber vines as ornamentals is spreading rapidly in Florida, Arizona, and southern California.

The new hybrid rubber vine showed a rubber content between 4 and 5 per cent in monthly periods of analysis, reaching nearly 7 per cent in some cases. The vines of the parent species seldom yield more than 3 per cent.

Ridsdel Group Makes Profits

Thanks mainly to a forward contract pooling plan entered into in 1930 by a number of rubber companies in the Ridsdel group, three of them are now able to report net earnings for the year to March 31 last. Sungei Gettah made a net profit of £1,322, compared with a loss of £1,368; Eaglehurst converted a loss of £2,921 into a profit of £740; while Harewood, in place of a loss of £2,266, now shows net earnings of £1,739.

In each case the results are partly explained by drastic savings in expenses. The all-in cost of Eaglehurst was reduced from 4.79d. to 3.26d. per lb.; that of Harewood from 4.65 to 3.02d., and that of Sungei Gettah (excluding depreciation) from 4.16d. to 3.09d. These economies, however, would not have availed to make production remunerative had it not been for forward sales, which helped to raise the average net sale price. Each company in this important group shows an improved cash position.

GAIN OF 26% REPORTED IN CUBAN TIRE TRADE

Cuban imports of pneumatic tires during the first five months of the present year remained at relatively high levels, a total of 41,194 having been imported through the port of Havana, as against 32,566 during corresponding period of 1931. This represents an increase of 26.5 per cent.

With very few exceptions, it is stated that stocks in dealers' hands are normal. The factory branches also, for the most part, have kept their stocks in line with the actual demand and have avoided unusually large shipments.

Attempts at Price Stabilization

For some months attempts have been made on the part of the factory branches to arrive at a more sound basis of discounts, etc., to dealers and national users. Up to June 10 the standard discount off the list prices was 15-10-10 per cent. The discount applied equally to the large and small dealers and also the national users. Numerous complaints were heard to the effect that the maximum discounts were given to other than national users, and that extra discounts were frequently given to some of the more important dealers.

The factory branches and distributors in Havana have recently held a series of meetings in an effort to arrive at a standard practice which would be followed by all and at the same time protect dealers throughout the island.

As a result of these negotiations, a flat increase of 10 per cent in the list prices of all sizes has been made, and the only discounts authorized are 20-10 per cent to dealers and national users. In order to protect the dealers a commission of 10 per cent has been agreed upon for authorized dealers. This commission is payable at the time of settlement of accounts and need not necessarily be granted. It is felt that through this provision dealers can be kept in line and forced to maintain prices, which has not been the case previously. At the same time the factory branch or distributor will not directly compete with the dealer by granting maximum discounts direct to national and other users.

The Automobile Chamber of Commerce in Cuba is cooperating in this plan. It is hoped that through this cooperative movement of the tire companies and the chamber of commerce the radical and unsound price cutting of dealers will largely be overcome. Obviously, to meet success all of the factory branches and distributors must conscientiously observe the provisions of the agreement, and it is too early at present to state what the outcome will be. This group feels that there is now a probability of definitely placing the automobile-tire business in Cuba on a more sound basis than has been the case for some time in the past.

BRITISH RUBBER TRADE SHOWS SHARP DECLINE

The United States rubber goods export trade to the United Kingdom will, no doubt, suffer a reduction of more than $1,500,000 annually because of the recent change in British fiscal policy, which has resulted in a general tariff and the imposition of certain heavy import duties, according to reports of the Rubber Division of the Department of Commerce. The products chiefly affected are rubberized fabrics and garments and rubber footwear.

In addition, bicycle tires and inner tubes are also subject to a customs duty of 33⅓ per cent ad valorem, and rubberized garments to 20 per cent, upon import into the United Kingdom from a foreign country, but are exempt if imported from, and the produce of a British country.

Foreign manufacturers of rubber goods, it would appear, will soon be induced to enlarge their present, or erect new factories in the United Kingdom, as was done after the tire duties were imposed in 1927. The United Kingdom import trade in rubber manufactures will most probably decrease by more than 50 per cent as a result of the existing duties; and, since the present volume of consumption will most probably tend to become greater, United Kingdom manufacturers of rubber goods should be able to increase their output and sales by not less than 10 per cent.

The value of the total British exports of rubber manufactures during the year 1931 was £6,450,570 ($31,388,474 at par of exchange), as compared with £8,338,613 ($40,575,691) for the year 1930, or a decrease of 22.6 per cent. On account of lower unit values, however, the decline in volume was much smaller.

The decrease in the number of tires exported in 1931, as compared with 1930, amounted to about 18 per cent, while according to the British Board of Trade index, the volume decline in exports of all other rubber manufactures, except machinery belting and rubberized garments, was only 9 per cent.

As compared with 1930, the decline in the value of all imports of rubber manufactures into the United Kingdom during 1931 amounted to 13.6 per cent, falling in value from £4,507,141 ($21,931,748 at par of exchange) to £3,894,206 ($18,949,206).

Although the decline in value of 1931 imports of rubber manufactures, other than tires, machinery belting, and rubberized garments, as compared with such imports in 1930, amounted to about 10.5 per cent, the decline in volume, according to the British Board of Trade index, was only 6.3 per cent. In the case of rubber boots and shoes, the decline in volume amounted to 6 per cent.

Wants Interest in Factory

A correspondent to THE RUBBER AGE states that he would like to purchase a half interest in a small rubber factory. If any of our readers are interested in such a proposition it is suggested that they communicate with the Editor.

Shell to Handle Goodrich

The Shell Petroleum Company recently announce that its Ohio service stations would enter the field of merchandising automobile tires and would stock a full line of Goodrich tires and tubes in their many branches throughout the state.

CLASSIFIED ADVERTISING

Five cents a word, minimum charge $2.00, payable in advance.
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LATE MARKET PRICES

RUBBER—COTTONS AND FABRICS—CHEMICALS

NEW YORK, AUGUST 5, 1932

Crude Rubber

THE market for crude rubber has reflected the rise which has occurred in all commodities in the past fortnight. The high consumption recorded during June, which established a new high for the year, also encouraged a bullish sentiment. The statistical position of rubber, while improved by reduced stocks in London and Liverpool, has not been materially changed, in view of the continued heavy shipments from the East. Increased consumption in European manufacturing centers is also aiding the market and there is a growing belief that consumption this year will more nearly balance actual production than was predicted by the most optimistic prognosticators. There has been an evident demand for actual rubber on both the Exchange and outside market, indicating that the industry is taking advantage of the present prices to increase inventories anticipatory to a gradual upturn.

Prices, as of August 5, as reported in the New York outside market, were as follows:

Plantations—			
Ribbed Smoked Sheets—			
Spot-August	.03¾	@	.03⅞
Oct.-Dec.	—	@	.03½
First Latex, crepe spot	—	@	.04
Amber Crepe, No. 2	—	@	.03¼
Amber Crepe, No. 3	—	@	.03 3/16
Amber Crepe, No. 4	—	@	.03
Brown Crepe, Clean thin	—	@	.03¼
Brown Crepe, rolled	.02½	@	.02 5/16
Latex—			
Liquid Latex, per gal.	.70	@	.75
Paras—			
Up-river, fine	—	@	.05¾
Up-river, coarse	Nominal		
Acre, Bolivian, fine	—	@	.06¼
Caucho Ball, Upper	—	@	.03
Centrals—			
Central scrap	.04	@	—
Esmeraldas	.04	@	—
Balata—			
Block, Ciudad	—	@	.18

LONDON MARKET

Standard Ribbed Smoked Sheets—Buyers			
Aug.	2¼	@	2 5/32d
Oct.-Nov.	2 7/32	@	2 9/32d

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—Sellers			
Spot	——	@	1¾d

Reclaimed Rubber

No changes in the price levels on the principal grades of reclaimed rubber were recorded during the last two weeks. Production continued to be restricted in line with curtailed demand. Present prices on reclaim admit of no further reduction without loss as present levels are very close to production costs. However, the outlook is brightening with every increase in crude rubber prices. Latest prices on the more familiar classes of reclaimed are reported as follows:

High Tensile				
High Tensile Red	lb.	.04¾	@	.05
Super-Reclaim Black	lb.	.05	@	.05¼
Shoe				
Washed	lb.	.05½	@	.05¾
Tube				
No. 1 (Floating)	lb.	—	@	.06½
No. 2 (Compounded)	lb.	.04½	@	.04¾
Tires				
Black	lb.	.03¾	@	.04
Black, selected tires	lb.	.04	@	.04¼
Dark Gray		.05	@	.05¼
Light Gray	lb.	.05½	@	.06
White	lb.	.05½	@	.05¾
Truck, Heavy Gravity	lb.	.05	@	.05¼
Truck, Light Gravity	lb.	.05¼	@	.05½
Miscellaneous				
Mechanical blends	lb.	.03	@	.03½

Scrap Rubber

There continues to be a dull market in the scrap rubber field. Prices are so low as not to be attractive to collectors and demand has necessarily fallen off with the reduction in reclaimed production. Many junk dealers have been forced out of the scrap rubber business by the prevailing low prices and accumulations have become increasingly difficult. Late prices on the principal scrap grades follow:

(Prices to Consumer)

Auto tire peelings	ton	17.00	@	18.00
Mixed auto	ton	6.50	@	8.00
Bicycle tires	ton	5.00	@	6.00
Clean solid truck tires	ton	20.00	@	22.00
Boots and shoes	ton	15.00	@	17.50
Arctics, untrimmed	ton	10.00	@	12.50
Inner tubes, No. 1	lb.	.02¼	@	.02¼
Inner tubes, No. 2, compounded	lb.	.01	@	.01¼
Inner Tubes, Red	lb.	.01⅝	@	.01¾
Air Brake Hose	ton	8.00	@	8.50
Rubber Hose	ton	6.00	@	8.00

Cotton

THE cotton market has responded to the general increase in all commodities. Efforts to absorb the huge holdings of the Farm Board through purchase engineered by a pool of mill owners seem ready to materialize. Late Government reports showing a reduction in crop production have helped the market. A decline in the purchase of fertilizers and heavy rains are attributed to be the cause for the drop in output. Reports also indicate a drop of 9.5 per cent in cotton acreage. Demand has been more evident within the last fortnight and exports have been favorably maintained.

High, low and closing prices on the New York Cotton Exchange, as of August 5, follow:

	High	Low	July 29 Close	July 20 Close
Aug.	——	——	5.85	5.66
Oct.	6.06	5.97	5.97	5.77
Dec.	6.23	6.14	6.15	5.92

Tire Fabrics

The slight increases in cotton prices have been too recent and trivial to yet show their effect on tire fabric prices and no changes are recorded for the past fortnight. However, a slight increase in demand for early deliveries is reported. Late prices on the principal tire fabric constructions are as follows:

(Prices Net at the Mill)

CORD				
Peeler, carded, 23/4/3	lb.	.21¾	@	.22
Peeler, carded 23/5/3	lb.	.20¾	@	.21
Peeler, carded, 13/3/3	lb.	.17¾	@	.18
Peeler, carded, 15/3/3	lb.	.18¾	@	.19
Egyptian, carded, 23/5/3	lb.	.31¾	@	.32
Egyptian, combed, 23/5/3	lb.	.36¾	@	.37
CHAFERS				
Carded, American, 8 oz.	lb.	.16½	@	.17
Carded, American, 10 oz.	lb.	.16½	@	.17
Carded, American, 12 oz.	lb.	.16½	@	.17
Carded, American, 14 oz.	lb.	.16	@	.16½
LENO BREAKER				
Carded, American, 8¼ oz.	lb.	.17	@	.20
Carded, American, 10¼ oz.	lb.	.17	@	.20
SQUARE WOVEN				
Carded, American, 17¼ oz. 23-11 ply	lb.	.20½	@	.21½
Carded, American, 17¼ oz. 10 ply	lb.	.15	@	.16½

Sheetings

Prices on sheetings showed no change over the last two weeks. Demand was confined to only immediate needs, in spite of low attractive price levels, and the market remained quiet and dull. Late prices follow:

40 inch, 2.50 yard	yd.	.04½	@	.04⅝
40 inch, 2.85 yard	yd.	.03⅞	@	.04
40 inch, 3.15 yard	yd.	—	@	.04⅞
40 inch, 3.60 yard	yd.	—	@	.04
40 inch, 3.75 yard	yd.	.03½	@	.03⅝
40 inch, 4.25 yard	yd.	.03	@	.03⅛

Ducks

Enameling	lb.	.14½	@	.15
Belting and Hose	lb.	.18	@	.18½
Single filling	lb.	.07	@	.07¼
Double filling	lb.	—	@	.08½

Closing Prices on Rubber Exchange of New York, Inc.

FROM JULY 20 TO AUGUST 5, 1932

Date		Spot	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Sales
July	20	2.77	2.72	2.75	2.79	2.84	2.89	2.94	3.00	3.05	3.11	3.16	45
	21	2.80	2.78	2.81	2.85	2.92	2.98	3.05	3.10	3.15	3.20	3.25	20
	22	2.95	2.88	2.91	2.95	2.99	3.04	3.09	3.16	3.22	3.29	3.35	105
	25	3.00	2.99	2.99	3.00	3.06	3.11	3.17	3.22	3.28	3.35	3.39	94
	26	3.05	3.03	3.06	3.10	3.16	3.21	3.26	3.32	3.38	3.45	3.49	97
	27	3.12	——	3.10	3.15	3.21	3.26	3.32	3.38	3.44	3.50	3.54	106
	28	3.08	——	3.07	3.10	3.16	3.22	3.29	3.34	3.40	3.46	3.52	99
	29	3.12	——	3.12	3.15	3.22	3.28	3.34	3.39	3.45	3.51	3.55	59
Aug.	1	3.25	——	3.22	3.27	3.32	3.36	3.40	3.47	3.54	3.61	3.65	152
	2	3.13	——	3.11	3.15	3.20	3.24	3.29	3.35	3.42	3.49	3.53	39
	3	3.13	——	3.11	3.15	3.21	3.26	3.32	3.39	3.45	3.52	3.56	88
	4	3.20	——	3.18	3.22	3.28	3.33	3.38	3.45	3.51	3.58	3.62	127
	5	3.25	——	3.24	3.28	3.34	3.41	3.47	3.54	3.60	3.67	3.70	107

*This contract will be superseded by "No. 1 B Standard" on April 1, 1933.

CHEMICALS

THE chemical price list continues without change except in the reduction of certain accelerators. Demand continues restricted to only immediate requirements and in small lots. Colloidal materials are receiving special attention in their connection with latex compounding. Late quotations of the principal rubber chemicals follow:

ACCELERATORS

Organic			
A-1	lb.	.24 @	.27
A-5-10	lb.	.33 @	.36
A-7	lb.	.55 @	.59
A-11	lb.	.62 @	.66
A-16	lb.	.57 @	.61
A-19	lb.	.58 @	.62
A-20	lb.	.64 @	.68
A-32	lb.	.80 @	.95
Aldehyde amonia, crystals	lb.	.65 @	.67
Altax	lb.		
Captax	lb		
Cryiene	lb.	.55 @	.65
paste	lb.	.45 @	.55
Di-Ortho-Tolyguanidine	lb.	.42 @	.43
Diphenylguanidine	lb.	.30 @	.32½
Ethylidene aniline	lb.	.45 @	.47½
Formaldehyde aniline	lb.	.37½@	.40
Heptene	lb.	.40 @	—
Hexamethylene-tetramine	lb.	.58½@	.59½
Lithex	lb.	.18 @	.20
Methylenedianiline	lb.	.37½@	.40
Monex	lb.	3.25 @	--
Oxynone	lb.	.68 @	.80
Phenex	lb.	.50 @	.55
R & H 40	lb.	.40 @	.41
R & H 50	lb.	.40 @	.41
R & H 397	lb.	.75 @	.76
R-2	lb.	1.95 @	2.15
Safex	lb.	1.20 @	1.25
SPDX	lb.	.75 @	—
Super-Sulphur No. 1	lb.		
No. 2	lb.		
Tensilac, No. 39	lb.	.40 @	.42½
Tensilac, No. 41	lb.	.50 @	.52½
Thermio F	lb.	.50 @	.55
Thiocarbanilid, drums	lb.	.20 @	.22
TMTT	lb.	3.00 @	3.25
Trimene	lb.	.75 @	—
base	lb.	1.20 @	—
Triphenylguanidine	lb.	.58 @	.60
Tuads	lb.		
Ureka	lb.	.75 @	1.00
Vulcanex	lb.		
Vulcone	lb.		
Vulcanol	lb.		
Z-88-P	lb.	.50 @	.60
Zimate	lb.		
Inorganic			
Lead, sublimed blue	lb.	.08¼@	—
Lead, white	lb.	.08½@	.08¾
Litharge, domestic	lb.	.06¼@	.07
Magnesia, calcined, light	per 100 lb.	5.35 @	5.45
heavy	per 100 lb.	3.65 @	3.75

COLORS

Blacks (See Compounding Materials)

Blues			
Prussian	lb.	.35 @	.36
Ultramarine	lb.	.06 @	.32
Browns			
Sienna, Italian	lb.	.05½@	.12½
Umber, Turkey	lb.	.04½@	.07
Greens			
Chrome, light	lb.	.30 @	.32
medium	lb.	.31 @	.33
dark	lb.	.34 @	.36
Chromium Oxide, bbl.	lb.	.34½@	.35½
Reds			
Antimony crimson, 15/17	lb.	.40 @	.44
sulfur, free	lb.	.56 @	.66
golden, 15/17 F.S.	lb.	.20 @	.25
Indian English	lb.	.08 @	.11
Domestic (Maroon)	lb.	.11 @	—
Red oxide, pure	lb.	.10 @	.12
Rub-Er-Red, f.o.b. Easton	lb.	.08¾@	—
Whites			
Lithopone, Albalith	lb.	.04½@	.04¾
Lithopone, Azolith	lb.	.04½@	.04¾
Titanium oxide	lb.	.21 @	—
Titanox B	lb.	.06½@	.07
Titanox C	lb.	.06½@	.07
Zinc Oxide—American Process			
American Azo:			
ZZZ (lead free)	lb.	.05¾@	.06
ZZ (leaded)	lb.	.05½@	.05¾
Horsehead Lead Free Brand:			
Selected	lb.	.05¾@	.06
Special	lb.	.05¾@	.06
XX Red	lb.	.05¾@	.06
XX	lb.	.05¾@	.06
XX Green	lb.	.05¾@	.06
Leaded Brand, Standard	lb.	.05½@	.05¾
Sterling	lb.	.05½@	.05¾
Superior	lb.	.05½@	.05¾
Lehigh	lb.	.05¼@	.05½
U. S. P., bbls.	lb.	— @	.12¾
Kadox, black label	lb.	.09⅝@	.09⅞
Blue label	lb.	.08⅝@	.08⅞
Red label	lb.	.07¼@	.07½
Cryptone, No. 19	lb.	.06½@	.06¾
Cryptone CB, No. 21	lb.	.06½@	.06¾
XX Zinc Sulphide, bbls.	lb.	— @	.13
St. Joe, black label	lb.	.05¾@	.06
green label	lb.	.05¾@	.06
red label	lb.	.05¾@	.06
Zinc Oxide—French Process			
Anaconda, lead free	lb.	.05¾@	.06
Anaconda, selected lead free	lb.	.06¼@	.06½
Florence White seal, bbls.	lb.	— @	.10⅞
Green seal	lb.	.09⅝@	.09⅞
Red seal	lb.	.08⅝@	.08⅞
Yellows			
Chrome	lb.	.16½@	.17
Ocher, domestic	lb.	.01⅝@	.02

BLACKS

Arrow "Aerfloted"			
c.l. f.o.b. works, bags	lb.	.02¾@	—
c.l. f.o.b. works, cases	lb.	.04¼@	—
less c.l. f.o.b. works	lb.	.05¼@	.07
Arrow "Aerfloted" Specification, c.l. f.o.b. wks., bags	lb.	.03 @	—
Bone, powdered	lb.	.05½@	.12½
Carbon, compressed	lb.	.02¾@	.07
uncompressed	lb.	.02¾@	.07
"Certified," Cabot			
c.l. f.o.b. works, bags	lb.	.02¾@	—
c.l. f.o.b. works, cases	lb.	.04¼@	—
less c.l. f.o.b. works	lb.	.05¼@	.07
"Disperso" f.o.b. La.	lb.	.028 @	.071
f.o.b. Texas	lb.	.02¾@	.07
Drop, bbls.	lb.	.05½@	.14
"Excello," compressed	lb.	.03 @	—
"Fumonex"	lb.	.02½@	.06
"Gastex"	lb.	.02½@	.06
Lampblack	lb.	.07 @	.10
"Micronex"			
c.l. f.o.b. works, bags	lb.	.03 @	—
c.l. f.o.b. works, cases	lb.	.04½@	—
less c.l. f.o.b. works	lb.	.05½@	.07
"Supreme"	lb.	.02¾@	—
Thermatomic—"P 33"	lb.	—	—
"Thermax"	lb.	—	—
United, "Dixie" and "Kosmos"			
c.l. f.o.b. works, bags	lb.	.02¾@	—
c.l. f.o.b. works, cases	lb.	.04¼@	—
less c.l. f.o.b. works	lb.	.05¼@	.07
"Velvetex"	lb.	.02 @	.05

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85 @	24.50
Ammonia carbonate, lump	lb.	.10½@	.12
Asbestine	ton	13.40 @	14.00
Barium carbonate	ton	56.50 @	57.00
Barium Dust	lb.	.05 @	.06
Barytes southern off-color	ton	12.00 @	18.00
Western prime white	ton	33.00 @	—
Basofor	lb.	.04½@	—
Bentonite	lb.	.02 @	.03
Blanc fixe dry f.o.b. works	ton	75.00 @	90.00
Carrara filler	lb.	.01¾@	.02
Catalpo (fact.)	lb.	.02 @	—
Chalk, precipitated			
Suprex white, extra lt.	ton	60.00 @	70.00
heavy	ton	45.00 @	55.00
Clay, Kaolin, domestic	ton	8.00 @	9.00
Aerfloted, Suprex	ton	6.50 @	8.00
Congaree	ton	9.00 @	—
Dark Blue Ridge	ton		
Dixie	ton		
Langford	ton		
Lexington	ton	10.00 @	22.00
Par	ton		
Tensulite	ton	15.00 @	—
Glues, extra white	lb.	.20 @	.25
medium white	lb.	.16 @	.20
Kalite No. 1	ton	30.00 @	55.00
Kalite No. 3	ton	40.00 @	65.00
Magnesia, carbonate	lb.	.08¾@	.11
Mica	lb.	.04½@	—
Rotten Stone (powdered)	lb.	.02 @	.05
Soapstone, powdered	ton	15.00 @	22.00
Starch, powdered	cwt.	— @	2.57
Talc, domestic	ton	12.00 @	15.00
Pyrax A	ton		
Whiting, commercial	cwt.	.85 @	1.00
English cliffstone	cwt.	1.50 @	1.70
Sussex	ton		
Witco	ton	20.00 @	—
Zinc Carbonate	lb.	.09½@	.10½
Zinc Stearate	lb.	.18½@	.22

MINERAL RUBBER

Genasco (factory	ton	40.00 @	42.00
Granulated M. R.	ton		
Hard Hydrocarbon	ton		
Parmr, solid	ton	28.00 @	48.00
Pioneer, MR, sclid	ton	40.00 @	42.00
Pioneer-granulated	ton	50.00 @	52.00
R & H Hydro-Carbon	ton	27.05 @	29.00

SOFTENERS

Acids			
Nitric, 36 degrees	cwt.	5.00 @	5.25
Sulfuric, 66 degrees	cwt.	1.60 @	1.95
Tartaric, crystals	lb.	— @	.26½
Acids, Fatty			
Laurex	lb.	.15 @	.16
Stearex	lb.	.13 @	.17
Stearic, double pressed	lb.	.17 @	.22
Alkalies			
Caustic soda, 76%	cwt.	2.90 @	—
Soda ash, 58% C.L.	cwt.	1.17½@	—
Oils			
Corn, refined, bbls.	lb.	.07 @	.08¾
Cottonseed, crude		— @	.04½
Cycline	gal.	.27 @	.34
Degras (c.l. 100 bbls.)	lb.	.03¾@	—
Less c.l. (10-25 bbls.)	lb.	.04 @	—
Lots less than 10 bbls.	lb.	.04¼@	.04½
Fluxrite	lb.	.05½@	.06½
Palm Lagos	lb.	.04 @	.05
Niger	lb.	.03½@	.04
Para-Flux	gal.	.17 @	—
Petrolatum, white	lb.	.08 @	.08½
Pigmentaroil	gal.	.18 @	.23
Pine, steam distilled	gal.	.54 @	.61
destructively distilled	gal.	.54 @	.55
Witco Palm Oil	lb.	.07½@	—
Witco Softener (f.o.b. wks.)	lb.	.02 @	—
Resins and Pitches			
Pitch, Burgundy	lb.	.06½@	.07½
coal tar	gal.	.05½@	.06
pine, 200 lb. gr. wt.	bbl.	7.00 @	—
Rosin, grade K, 280 lb.	bbl.	— @	4.60
Pigmentar	gal.	.18 @	.23
Tar Retort, 50 gal.	bbl.	13.50 @	15.00
Solvents			
Acetone, pure	lb.	— @	.10
Alcohol, denatured, No. 1 bbls.	gal.	.28 @	.29
Benzol, 90%	gal.	.20 @	.21
Carbon, bisulfide	lb.	.05½@	.06⅛
Carbon, tetrachloride	lb.	.06¼@	.07
Dryolene (f.o.b. Okla.)	gal.	.10 @	.10⅓
Gasoline, steel bbls.	gal.	.16 @	—
Naphtha, solvent	gal.	.26 @	.28
Rub-Sol (f.o.b. Okla.)	gal.	.09 @	—
Turpentine, spirits	gal.	— @	.37¼
wood	gal.	— @	.40
destructively distilled	gal.	.35 @	—
Waxes			
Beeswax, white	lb.	.34 @	.36
Carnauba	lb.	.26 @	.28
Ceresin, white	lb.	.10 @	.11
Montan, crude	lb.	.06½@	.07
Ozokerite, black	lb.	.24 @	.25
green	lb.	.26 @	.30
Paraffin (c.l.—f.o.b. N. Y.)			
Yellow crude scale	lb.	.02½@	—
White crude scale 124/126	lb.	.02½@	—
Refned, 125/127	lb.	.03⅝@	—
Refined, 128/130	lb.	.03¾@	—
Refined, 135/137	lb.	.05¼@	—
Refined, 138/140	lb.	.07¼@	—

ANTI-OXIDANTS

AgeRite, Gel	lb.		
Powder	lb.		
Resin	lb.		
White	lb.		
Albasan	lb.	.70 @	.75
Antox	lb.		
B-L-E	lb.	.57 @	.60
Neozone	lb.		
Oxynone	lb.	.68 @	.80
Resistox	lb.	.54 @	.57
Retardex	lb.	.35 @	.40
Stabilite	lb.	.57 @	.62
Stabilite Alba	lb.	.70 @	.75
VGB	lb.	.55 @	.60

SPECIALTIES

Aromatics- Rodo	lb.		
Sunproof	lb.	.35 @	.37½
Sponge Paste	lb.	— @	.30
Tonox	lb.	.56 @	.60

SUBSTITUTES

Black	lb.	.07 @	.09
White	lb.	.08 @	.14
Brown	lb.	.07 @	.11

VULCANIZING INGREDIENTS

Sulfur Chloride (drums)	lb.	.03½@	.04⅓
Sulfur flour,			
Ref'n'd, 100% pure (bags)	cwt.	2.40 @	2.75
Commercial (bags	cwt.	1.75 @	2.10
Telloy	lb.		
Vandex	lb.		

TIRES & TUBES
CRUDE RUBBER

STATISTICAL SECTION

AUTOMOBILES
GASOLINE

INDICATIONS are that June rubber consumption represented stepped-up production in tires and tubes in anticipation of the Federal excise tax and the rate may show a decline for July but on the other hand it is evident from many quarters that increased activities are taking place in the industry, particularly in the smaller companies. Prices on the New York market for crude show considerable improvement during the fortnight and demand for actual rubber has increased. Sustained consumption in European manufacturing centers and reports of reductions in crude rubber production have helped to stimulate the market. Stocks in leading centers show slight recessions, irrespective of the fact that imports from the East continue to hold up.

The whole tone of the commodity market has improved along with the general sentiment that business is beginning the upward turn. The statistical position of rubber reflects this sentiment in several ways. Automobile production shows a decline but this may be seasonal and anticipatory to the introduction of new models.

Latest figures covering imports and exports of crude rubber from leading producing and consuming centers are included in the appropriate tables in this section.

PLAN OF THE SECTION

The statistics included in this section have been chosen for their constant importance to the rubber industry. The tables are reprinted in the same relative position in every issue, each table being kept current by the addition of new figures as soon as they become available.

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U. S. Imports and Exports of Crude Rubber

	Gross Imports			Re-exports			Net Imports
YEARS	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons
1921	185,394	73,772,677	17.76	5,716	2,414,924	18.86	179,678
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,637	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927	426,258	339,874,774	35.60	27,775	24,735,488	39.76	398,483
1928	439,731	244,854,973	25.03	32,159	18,128,361	25.17	407,572
1929	560,084	239,178,783	19.15	36,485	16,868,733	20.64	523,599
1930	482,082	139,134,330	12.89	30,205	9,316,205	13.77	451,877
1931	497,138	72,918,949	6.54	25,595	4,255,572	7.42	471,543
1930:							
Jan.	47,496	17,793,563	16.72	3,144	1,077,415	15.30	44,352
Feb.	42,687	14,798,240	15.48	2,280	960,790	18.80	40,407
Mar.	44,976	14,653,243	14.54	3,187	1,192,708	16.71	41,789
Apr.	45,423	14,783,605	14.53	2,688	892,532	14.82	42,735
May	42,692	13,373,232	13.98	3,154	1,085,432	15.37	39,538
June	39,993	12,215,848	13.79	3,174	1,028,653	14.47	36,819
July	35,182	10,553,944	13.39	2,807	759,260	12.08	32,375
Aug.	35,713	9,666,362	12.08	2,357	655,773	12.42	33,356
Sept.	35,380	8,460,812	10.68	1,514	430,772	12.70	33,866
Oct.	46,069	9,893,980	9.59	2,432	419,325	7.70	43,637
Nov.	29,401	5,700,086	8.66	1,300	271,348	9.32	28,101
Dec.	37,300	7,175,242	8.59	2,168	542,197	11.17	35,132
1931:							
Jan.	36,307	7,190,591	8.84	1,706	350,480	9.17	34,601
Feb.	34,005	6,564,969	8.62	1,799	357,078	8.86	32,206
Mar.	40,393	7,356,505	8.13	2,800	534,180	8.52	37,593
Apr.	44,536	7,712,941	7.73	2,607	528,947	9.06	41,929
May	35,526	5,886,638	7.40	2,501	418,301	7.47	33,025
June	46,233	6,918,900	6.68	2,749	440,604	7.15	43,484
July	43,469	6,023,748	6.19	1,435	223,587	6.96	42,034
Aug.	38,669	5,138,404	5.93	2,324	345,953	6.65	36,345
Sept.	38,494	4,970,324	5.76	1,362	187,431	6.14	37,132
Oct.	41,131	4,803,582	5.21	1,527	203,574	5.95	39,604
Nov.	43,435	4,742,218	4.72	1,403	198,284	6.31	43,435
Dec.	53,536	5,610,129	4.68	2,462	326,382	5.91	51,070
1932:							
Jan.	33,221	3,387,505	4.55	1,524	185,466	5.43	31,697
Feb.	27,959	2,690,250	4.29	1,915	222,584	5.19	26,044
Mar.	45,197	4,251,801	4.19	2,227	240,128	4.84	42,970
April	37,903	3,181,343	3.74	2,128	196,934	4.53	35,775
May	34,182	2,798,914	3.71	1,505	144,561	4.30	32,677
June	40,808	2,647,085	2.89	1,981	134,336	3.02	39,136

U. S. Consumption of Crude Rubber

(Rubber Manufacturers' Association statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

Jan.	29,638	32,196	31,518	34,403	43,002	36,194	25,557	27,962
Feb.	29,761	31,136	30,137	33,702	41,594	33,302	28,797	30,011
Mar.	33,498	32,936	36,141	35,688	44,730	35,540	32,788	27,828
Apr.	34,139	32,696	35,871	32,772	47,521	39,686	33,321	25,953
May	35,322	29,364	34,592	37,333	49,233	39,386	37,817	29,197
June	35,822	28,598	33,801	37,676	43,227	34,195	37,916	39,116
July	36,053	27,577	29,219	37,407	41,526	29,508	31,937	——
Aug.	35,909	34,533	33,460	42,927	38,274	30,850	27,586	——
Sept	31,691	32,904	27,214	39,882	34,707	25,515	23,638	——
Oct.	29,047	29,936	26,790	40,857	34,800	27,516	22,277	——
Nov.	28,253	28,080	26,792	37,461	27,659	23,691	22,943	——
Dec.	28,748	26,293	25,492	31,232	23,531	21,687	21,409	——
Totals	388,481	366,149	371,027	441,340	469,804	375,980	348,986	——

Figures on Quarterly Basis

Quarter	1925	1926	1927	1928	1929	1930	1931	1932
Jan./Mar.	95,263	94,301	99,216	103,558	128,565	101,610	89,652	——
Apr./June	104,099	87,109	103,242	103,500	139,292	112,229	107,755	——
July/Sept.	99,493	93,793	89,210	117,573	113,746	85,261	83,632	——
Oct./Dec.	85,789	83,212	80,860	117,597	84,872	72,020	65,645	——
Totals	384,644	358,415	372,528	442,227	466,475	371,120	346,684	——

Note—The Rubber Association estimates its monthly rubber consumption figues to be 80 per cent complete. Up until 1925 the quarterly figures were likewise estimated to be 90 per cent complete; beginning with 1925 an estimate of 92 per cent completeness has been used. These estimates have been used in raising the figures in this table to 100 per cent. The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

U. S. Consumption of Gasoline

(In Thousands of Barrels of 42 Gallons)

	1930	1931	1932		1930	1931	1932
January	25,731	26,844	26,845	July	38,256	39,459	——
February	26,509	26,133	25,344	August	37,433	39,459	——
March	31,029	31,037	29,451	September	37,823	36,670	——
April	34,549	33,400	30,252	October	32,267	35,051	——
May	36,497	35,716	31,574	November	30,984	30,640	——
June	35,902	38,375	——	December	29,094	30,529	——

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

1930	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave.
January	—	15¾	15⅝	15⅝	—	15⅝	15⅝	15	14⅞	14½	14⅝	—	—	14⅝	14⅝	14⅞	14⅞	15½	—	14⅝	14⅝	14⅞	15¼	15¼	15¼	—	15⅝	15¼	15¼	15¼	15¼	8⅝
February	—	—	15	15	15¼	15⅝	15½	15½	—	15⅞	16	—	15⅞	15⅞	15⅞	15⅞	16⅜	16⅝	16½	16⅝	16½	14⅞	—	16	16	—	15⅝	15⅝	—	—	15¾	7⅞
March	15⅞	15⅞	15⅝	15⅝	15	15⅝	15⅝	15⅝	15⅝	15⅝	15	15½	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15¾	15½	15½	15½	15½	15½	15⅝	15⅝	15⅝	15¾	15¾	15⅝	7¾
April	15½	15½	15½	15¼	15¼	15¼	15¼	15¼	15½	15½	15¾	15½	15½	14⅞	15	15	15	15	15	15	15	14⅞	14⅞	14⅝	14⅝	14⅝	14⅝	14⅝	14¾	—	—	7¼
May	14⅞	14⅞	14⅝	14¼	14¼	14¼	14¼	14¼	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14¼	14¼	14¼	14¼	14¼	14¼	14	—	—	7¼
June	13¾	13¾	13¾	13⅝	13⅝	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	—	6¾
July	12¼	12¼	12	—	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	—	6¾
August	10⅝	10⅝	10⅝	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	—	6¾
September	9⅝	9⅝	9⅝	9⅝	9	8½	8½	8¾	8⅞	8¾	8⅞	9¼	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	—	6⅝
October	7⅞	7⅞	8¼	8	—	8	8	8	8	7⅞	8¼	8	8	7⅞	8	8	7⅞	8	8	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	—	6⅝
November	8¼	8¼	8⅝	—	8⅜	8⅜	8⅜	8⅜	8⅜	8½	8⅝	9½	9⅝	9⅝	9⅝	9⅝	9⅝	9½	9⅝	9⅝	9⅝	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	8½	9
December	9½	9½	9½	9¼	9¼	9¼	—	9⅝	9½	9⅝	9⅝	9⅝	9⅝	—	9	9	8⅝	9	9⅜	8⅝	—	8⅝	8⅝	8⅝	—	8⅝	8⅝	8⅝	8⅝	8½	8⅝	9
1931																																
January	—	—	8⅝	—	8½	8⅜	8⅜	8⅜	8⅜	8⅝	—	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	—	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8⅛	8⅛	—	8⅜
February	—	—	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	—	—	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7½	7½	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	—	—	7¾
March	—	—	8	8⅜	8¼	8⅛	8⅛	—	—	8	8	—	8	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	—	—	7¾
April	—	—	—	—	—	6¾	6¾	6¾	6¾	6¾	6¾	6¾	6¾	6¾	6¾	6¾	6¾	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	—	—	6½
May	6	6	—	—	—	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	—	—	6¼
June	6⅜	6⅜	6⅜	6⅜	6⅜	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	—	—	6½
July	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	—	—	6¼
August	5⅞	5⅞	5⅞	5¾	5¾	5½	5½	5½	5¾	5¾	5¾	5½	5½	5¾	5¾	5¾	5¾	5¾	5¾	5¾	5¾	5¾	5¾	5¾	5¾	5¾	5¾	5¾	5¾	5¾	—	—	5¾
September	5¼	5¼	5¼	5¼	5¼	5¼	5¼	5¼	5¼	5¼	5¼	5¼	5¼	5¼	5¼	5¼	5¼	5¼	5¼	5¼	5¼	5¼	5¼	5¼	5¼	5¼	5¼	5¼	5¼	5¼	5¼	5¼	5¼
October	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾
November	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½
December	—	4⅜	4⅜	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1932																																
January	—	—	—	4½	4½	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	—	4⅛
February	—	4⅜	4⅜	4¼	4¼	4⅛	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4
March	3½	3½	3½	3½	3½	—	3⅝	3½	3½	3½	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3¼
April	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
May	—	3	3¼	3¼	3¼	3¼	4	4⅛	—	3⅝	3¼	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	—	2⅝	2⅝
June	2¾	2¾	2¾	2¾	2¾	4	2¾	2¾	2¾	2¾	2½	2½	—	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	—	2½
July	—	—	—	—	—	3⅝	2⅝	2⅝	2¾	2¾	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
August	3¼	3¼	3¼	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1925

Year	Cents	Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15	1922	17.50
1911	141.30	1915	65.85	1919	48.70	1923	29.45
1912	121.60	1916	72.50	1920	36.30	1924	26.20
1913	82.04	1917	72.23	1921	16.36	1925	72.46

Average Monthly Price per Pound Since 1926

Month	1926 Cents	1927 Cents	1928 Cents	1929 Cents	1930 Cents	1931 Cents	1932 Cents
Jan.	79.50	38.75	40.25	20.14	15.24	8.34	4.38
Feb.	62.25	38.25	32.75	23.97	15.85	7.70	4.03
Mar.	59.00	41.04	26.82	24.55	15.34	7.71	3.35
Apr.	51.25	40.86	18.97	21.18	14.93	6.43	3.02
May	47.75	40.76	18.99	21.46	14.24	6.49	3.09
June	42.50	37.25	19.59	20.64	12.45	6.35	2.66
July	41.03	34.87	19.40	21.30	11.24	6.37	2.89
Aug.	38.50	35.12	19.46	20.59	9.96	5.38	—
Sept.	41.00	33.67	18.47	20.37	8.28	5.08	—
Oct.	42.50	34.32	18.83	19.67	8.20	4.87	—
Nov.	38.50	37.58	18.26	16.62	9.01	4.65	—
Dec.	38.25	40.63	17.97	16.12	9.05	4.64	—
Average for Year	48.50	37.72	22.48	20.55	11.98	6.17	—

London Closing Prices of Ribbed Smoked Sheet

(In Pence Per Pound)

Day	May	June	July	Aug.	Day	May	June	July	Aug.
1	—	1 11/16	1 11/16	—	18	1⅞	1¾	1⅞	—
2	1⅞	1 11/16	1 11/16	2⅛	19	1⅞	—	1⅞	—
3	2	1 11/16	—	2 3/16	20	1⅞	1¾	1⅞	—
4	2	1 11/16	1¾	2¼	21	1⅞	1¾	1⅞	—
5	2	—	1¾	2¼	22	—	1¾	1⅞	—
6	2	1 11/16	1 13/16	—	23	1¾	1¾	1⅞	—
7	2⅛	1 11/16	1 13/16		24	1¾	1¾	1⅞	—
8	2⅛	1 11/16	1 13/16	—	25	1⅝	1¾	—	—
9	2⅛	1 11/16	1 13/16	—	26	1⅝	1¾	1 5/16	—
10	2	1 11/16		—	27	1⅝	1 11/16	1 1/16	—
11	2	1 11/16	1⅞	—	28	1⅝	1 11/16	2 1/16	—
12	1⅞	—	1⅞	—	29	—	1¾	2 1/16	—
13	1⅞	1 11/16	1⅞	—	30	1⅝	1¾	2 1/16	—
14	1⅞	1¾	1⅞	—	31	1⅝	—	—	—
15	—	1 11/16	1⅞	—	July	11.065	5.648	3.048	1.875
17	—	1¾	—	—					

Average Monthly Price Per Pound

Month	1929 Pence	1930 Pence	1931 Pence	1932 Pence	Month	1929 Pence	1930 Pence	1931 Pence	1932 Pence
Jan.	9.942	7.471	4.160	3.052	Aug.	10.505	4.880	2.385	—
Feb.	11.875	7.948	3.823	2.760	Sept.	10.160	4.075	2.524	—
Mar.	12.135	7.595	3.822	2.047	Oct.	9.620	4.023	2.898	—
Apr.	10.490	7.391	3.082	1.876	Nov	8.442	4.440	2.890	—
May	10.717	6.926	3.035	1.825	Dec.	7.958	4.516	3.115	—
June	10.580	6.195	3.082	1.750	Average for Year	10.291	5.926	3.155	—
July	11065	5.648	3.048	1.875					

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Day of Month	June	July	Aug.	Day of Month	June	July	Aug.	Day of Month	June	July	Aug.
1	4.92	5.95	6.05	11	5.05	5.85	—	21	5.35	5.75	—
2	5.14	—	5.90	12	—	5.70	—	22	5.30	5.85	—
3	5.02	—	5.90	13	5.15	5.90	—	23	5.30	5.75	—
4	5.22	—	5.90	14	5.20	5.70	—	24	5.30	—	—
5	—	5.95	6.00	15	5.35	5.90	—	25	5.30	5.75	—
6	5.20	6.20	—	16	5.35	5.90	—	26	—	5.80	—
7	5.20	6.00	—	17	5.25	—	—	27	5.35	5.95	—
8	5.10	6.10	—	18	5.20	5.75	—	28	5.35	5.95	—
9	5.00	5.90	—	19	—	5.85	—	29	5.55	6.00	—
10	5.10	—	—	20	5.30	5.80	—	30	5.80	6.05	—
								31	—	—	—

Average Monthly Price Per Pound

Month	1929 Cents	1930 Cents	1931 Cents	1932 Cents	Month	1929 Cents	1930 Cents	1931 Cents	1932 Cents
Jan.	20.22	17.21	10.27	6.65	Aug.	18.62	12.03	7.21	—
Feb.	20.21	15.62	10.96	6.85	Sept.	18.83	10.85	6.52	—
Mar.	20.19	15.13	10.90	6.86	Oct.	18.46	10.63	6.32	—
Apr.	20.29	16.39	10.19	6.16	Nov.	17.53	10.96	6.44	—
May	19.41	16.43	9.38	5.72	Dec.	17.28	10.02	6.24	—
June	18.74	14.48	9.05	5.22	Average for Year	19.03	13.57	8.56	—
July	18.62	13.10	9.28	5.87					

World Stocks of Crude Rubber

ON HAND OR AFLOAT TO THE U. S.

At End of	ON HAND 1930	ON HAND 1931	ON HAND 1932	AFLOAT 1930	AFLOAT 1931	AFLOAT 1932	ON HAND AND AFLOAT 1930	ON HAND AND AFLOAT 1931	ON HAND AND AFLOAT 1932
Jan.	131,744	209,487	322,860	61,863	56,187	42,234	193,607	265,674	365,094
Feb.	143,863	212,833	322,117	63,404	63,680	51,728	207,267	276,513	373,845
Mar.	141,843	217,804	334,566	63,646	63,133	44,190	205,489	280,937	378,756
Apr.	148,272	228,382	343,099	63,261	56,700	40,387	211,533	285,082	383,486
May	146,179	220,799	———	68,168	73,564	———	214,347	294,363	———
June	151,551	225,536	———	58,657	69,421	———	210,209	294,957	———
July	152,001	234,822	———	58,326	66,873	———	210,327	301,695	———
Aug.	158,604	240,816	———	61,168	61,469	———	219,772	302,285	———
Sept.	169,927	254,324	———	60,923	62,420	———	230,851	316,744	———
Oct.	185,470	273,456	———	51,122	68,427	———	236,593	341,883	———
Nov.	189,925	292,493	———	52,538	77,443	———	242,463	369,936	———
Dec.	200,998	322,826	———	56,035	53,940	———	257,033	376,766	———

(Rubber Manufacturers' Association figures raised to 100%)

STOCKS IN GREAT BRITAIN

Stocks in London

(No. of Tons in Wharves and Warehouses, including Latex)

At end of	1930	1931	1932	At end of	1930	1931	1932
Jan.	60,434	81,093	67,166	July	81,048	81,317	———
Feb.	64,557	82,265	65,942	Aug.	80,931	81,560	———
Mar.	68,923	84,736	64,280	Sept.	83,329	79,692	———
Apr.	74,676	86,982	61,848	Oct.	77,647	76,778	———
May	77,312	86,726	56,089	Nov.	76,887	73,911	———
June	80,260	83,071	51,009	Dec.	78,013	69,470	———

At End of Recent Weeks

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1932					
January	69,504	68,967	68,272	67,545	67,157
February	67,410	67,824	67,314	65,923	
March	65,459	65,121	65,014	64,461	
April	63,813	64,015	63,717	63,348	61,850
May	61,411	58,101	58,606	56,504	
June	55,535	54,636	52,636	51,785	
July	50,656	50,188	49,327	49,105	

Stocks in Liverpool

1932					
January	57,718	57,652	58,662	58,328	58,182
February	59,155	59,874	59,514	59,868	
March	60,288	60,776	60,922	60,775	
April	61,010	60,872	61,302	61,433	61,480
May	61,674	60,909	60,583	60,148	
June	60,119	50,551	58,601	58,441	
July	58,569	58,335	57,622	57,618	

STOCKS IN PENANG AND SINGAPORE

(Stocks held by Dealers—Quantities in Long Tons)

End of	1929	1930	1931	1932	End of	1929	1930	1931
Jan.	29,617	39,727	48,802	48,850	July	33,859	45,459	51,203
Feb.	32,373	44,371	49,283	46,954	Aug.	30,834	48,132	48,971
Mar.	29,437	45,657	49,590	46,591	Sept.	32,138	44,015	47,025
Apr.	26,474	48,473	45,868	39,663	Oct.	33,770	39,930	52,132
May	30,764	44,715	44,278	38,690	Nov.	30,963	41,674	46,497
June	30,403	42,451	47,517	19,770	Dec.	35,548	45,963	45,795

STOCKS IN OTHER CENTRES

1930 End of	Malaya Mainland	Afloat for Europe	Holland	Colombo	Para and Manaos
1931:					
Jan.	41,620	24,500	3,163		5,124
Feb.	43,027	24,580	3,326		5,404
Mar.	40,227	21,990	3,622	3,857	4,843
Apr.	37,103	18,500	3,659		5,137
May	37,171	17,770	3,380		4,896
June	38,748	18,440	3,219	3,518	4,894
July	40,377	19,960	3,111		4,548
Aug.	40,606	18,880	3,204		4,571
Sept.	37,114	16,200	3,293	2,763	4,972
Oct.	35,381	17,800	3,100		5,465
Nov.	39,193	19,570	2,799		5,506
Dec.	41,219	20,140	2,568	3,607	5,576
1932:					
Jan.	43,938	19,090	3,065		6,342
Feb.	43,695	18,920	3,093		6,641
Mar.	43,329	17,470	3,172	2,200	6,378
Apr.	42,642	15,660	3,404		6,469
May	45,422	16,000	3,427		6,438
June	43,994	16,000			

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total	Per Cent Balloons		Total	Per Cent Balloons
1923	23,140,620	0.6	1927	19,700,003	79.1
1924	21,863,311	19.7	1928	24,247,282	81.6
1925	26,001,664	66.8	1929	24,141,502	80.3
1926	24,199,524	78.8	1930	17,364,096	80.1
1931			1931		
January	681,301	67.9	July	812,642	74.0
February	1,010,774	73.9	August	924,236	80.8
March	1,425,336	81.4	September	504,879	70.4
April	1,717,652	79.9	October	281,749	62.7
May	1,508,349	83.7	November	638,138	78.0
June	1,084,707	77.8	December	714,037	80.1
1932			1932		
January	810,759	89.0	April	652,126	69.8
February	726,172	84.2	May	657,995	74.0
March	648,013	81.6	June	499,441	82.3

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1924	1925	1926	1927	1928	1929	1930	1931
Production	51,633	60,845	61,237	64,439	77,944	68,726	50,965	48,739
Shipments	50,120	59,262	59,002	64,059	74,296	69,395	53,638	48,151
Inventory[2]	7,427	8,142	10,456	10,264	13,624	11,838	9,003	110,233

Figures for Recent Months

	PRODUCTION 1930	1931	1932	SHIPMENTS 1930	1931	1932	INVENTORY 1930	1931	1932
Jan.	4,485	3,675	3,462	4,406	3,744	3,253	11,925	8,957	7,912
Feb.	4,555	3,985	3,871	4,195	3,402	2,553	11,410	9,536	9,172
Mar.	4,863	4,663	3,671	4,717	4,122	2,954	12,513	10,014	9,878
Apr.	5,648	4,944	———	5,089	4,932	———	13,076	10,031	———
May	5,717	5,679	———	5,216	5,415	———	13,432	10,312	———
June	5,122	5,672	———	5,294	5,572	———	13,277	10,447	———
July	3,991	4,926	———	5,447	5,462	———	11,812	9,919	———
Aug.	4,166	3,906	———	5,175	4,960	———	10,848	8,896	———
Sept.	3,365	3,172	———	4,405	3,932	———	9,812	8,158	———
Oct.	3,582	2,974	———	3,499	2,852	———	9,803	8,300	———
Nov.	2,654	2,500	———	2,834	2,887	———	9,595	7,919	———
Dec.	2,814	2,643	———	3,361	2,871	———	9,003	7,744	———

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1924	1925	1926	1927	1928	1929	1930	1931
Production	70,706	82,614	76,618	70,823	80,180	68,829	52,420	48,333
Shipments	68,106	81,004	71,591	72,896	77,127	70,592	54,938	50,021
Inventory[2]	11,052	11,313	16,200	13,692	16,117	12,807	9,999	112,121

Figures for Recent Months

	PRODUCTION 1930	1931	1932	SHIPMENTS 1930	1931	1932	INVENTORY 1930	1931	1932
Jan.	4,607	3,623	3,308	4,857	4,062	3,529	12,704	9,439	7,719
Feb.	4,634	3,916	3,821	4,337	3,400	2,728	13,036	9,921	8,760
Mar.	4,941	4,450	3,502	4,727	3,789	2,686	13,179	10,475	9,448
Apr.	5,510	4,617	———	4,848	4,636	———	13,784	10,413	———
May	5,535	5,413	———	5,074	5,281	———	13,852	10,549	———
June	4,950	5,358	———	5,265	5,397	———	13,612	10,504	———
July	3,939	4,955	———	5,855	5,831	———	11,657	9,589	———
Aug.	4,796	4,435	———	5,762	5,301	———	10,737	8,774	———
Sept.	3,817	3,449	———	4,541	4,150	———	10,065	8,095	———
Oct.	3,951	3,077	———	3,472	2,813	———	10,517	8,321	———
Nov.	2,680	2,443	———	2,788	2,594	———	10,313	8,119	———
Dec.	3,060	2,597	———	3,412	2,767	———	9,999	7,922	———

(1) Rubber Manufacturers' Association figures, raised to 100%. The Association estimates its figures to be 75% complete up until 1929 and 80% complete beginning with 1929, and that basis has been accepted when preparing the statistics in this table.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	United States Total	United States Passenger Cars	United States Trucks	Canada Total	Canada Passenger Cars	Canada Trucks	Grand Total
1926	4,298,799	3,808,753	490,046	205,002	164,483	40,609	4,503,891
1927	3,393,887	2,938,868	453,019	179,426	146,850	32,556	3,573,313
1928	4,357,384	3,826,613	530,771	242,382	196,737	45,645	4,599,944
1929	5,358,420	4,587,400	771,020	263,295	207,498	55,797	5,621,715
1930	3,355,986	2,814,452	540,534	154,192	125,442	28,750	3,510,178
1931							
Jan.	171,848	138,317	33,531	6,496	4,552	1,944	178,344
Feb.	219,940	180,419	39,521	9,871	7,529	2,342	229,811
Mar.	276,405	231,244	45,161	12,993	10,483	2,510	289,398
Apr.	336,939	285,693	50,015	17,159	14,043	3,116	354,098
May	317,163	269,420	45,695	12,738	10,621	2,117	329,901
June	250,640	208,158	41,304	6,835	5,583	1,252	257,475
July	218,490	183,107	35,854	4,220	3,151	1,069	222,710
Aug.	187,197	155,425	31,772	4,544	3,426	1,118	191,741
Sept.	140,566	109,228	31,338	2,646	2,108	538	143,212
Oct.	80,142	58,415	21,727	1,440	761	679	81,582
Nov.	68,867	49,184	19,683	1,247	812	435	70,114
Dec.	121,533	97,897	23,636	2,432	408	2,024	123,965
Total	2,389,730	1,973,090	416,640	82,621	63,477	19,144	2,472,351
1932							
Jan.	119,344	98,785	20,541	3,731	3,112	619	123,075
Feb.	117,418	94,110	23,308	5,477	4,494	983	126,621
Mar.	118,959	99,399	19,560	8,318	6,604	1,714	127,277
May	185,149	157,756	27,933	8,221	7,269	952	193,370
June	183,092	160,330	27,754	7,112	6,308	804	190,204

Exports of Crude Rubber from Principal Producing Countries

(Long Tons)

	BRITISH MALAYA[1]							DUTCH EAST INDIES[5]							
	Gross Exports	Imports	Gross Exports Minus Imports	Ceylon[2]	India & Burma[3]	Sarawak[4]	British North Borneo[3]	Siam[4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China[3]	Amazon Valley	All Other[4]	World Total[7]
1923	252,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,415
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,366
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	514,487
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,530
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,545	28,782	15,633	606,474
1928	409,430	149,787	259,643	57,267	10,790	10,087	6,698	4,813	58,848	82,511	121,770	9,548	21,129	10,690	653,794
1929	574,836	163,092	411,744	81,584	11,663	11,077	7,381	5,018	65,990	87,789	134,037	9,696	21,148	6,767	853,894
1930	547,043	133,876	413,167	76,970	10,782	10,309	6,781	4,251	69,755	79,396	115,254	7,665	14,260	5,651	814,241
1930:															
Mar.	47,320	12,236	35,084	6,617	1,219	976	642	391	5,796	6,612	11,214	643	1,674	536	71,314
Apr.	43,803	14,627	29,176	4,444	856	1,026	502	366	4,802	6,326	12,724	433	1,201	630	62,486
May	49,016	13,253	35,763	5,968	975	917	502	350	6,352	6,661	12,041	753	1,383	555	72,220
June	36,607	12,120	24,487	4,577	778	1,040	201	392	4,728	4,776	9,512	425	974	551	52,441
July	41,347	12,759	28,588	3,868	792	1,087	600	327	6,022	5,891	9,770	648	810	418	58,821
Aug.	47,802	10,304	37,498	7,077	600	740	600	335	5,892	7,197	9,520	394	809	382	71,044
Sept.	48,529	8,087	40,442	7,966	343	680	600	289	5,960	6,358	7,302	527	1,093	474	72,034
Oct.	47,770	7,312	40,458	7,681	591	598	650	300	5,916	6,956	6,352	667	669	449	71,287
Nov.	41,281	7,774	33,507	6,042	864	631	600*	311	5,334	6,401	8,001	654	658	238	63,241
Dec.	42,086	9,671	32,415	6,934	1,049	976	600*	335	6,254	7,196	8,476	721	1,365	353	66,674
1931:															
Jan.	41,579	11,029	30,550	7,039	1,315	770	542	424	5,923	7,348	10,328	1,218	994	295	66,746
Feb.	41,951	9,672	32,279	6,365	1,041	945	542	409	4,869	7,206	9,001	1,018	1,271	217	65,163
Mar.	48,589	12,009	36,580	5,881	1,209	930	542	536	5,434	7,104	11,258	1,233	1,338	430	72,475
Apr.	43,453	9,977	33,476	4,333	641	788	455	340	6,473	6,068	8,759	327	629	333	62,617
May	44,281	10,479	33,802	4,242	622	869	455	413	7,373	6,799	10,955	793	1,110	382	67,815
June	39,397	12,115	27,282	5,098	1,086	1,138	455	337	5,856	6,696	11,380	1,019	621	351	61,319
July	43,658	11,995	31,663	4,517	715	801	536	316	6,671	7,511	10,711	859	1,565	186	66,051
Aug.	42,832	9,063	33,769	3,763	406	692	535	210	6,397	7,044	8,641	1,097	856	241	63,651
Sept.	44,336	8,369	35,967	4,029	169	701	535	218	5,577	7,358	8,389	917	745	183	64,788
Oct.	45,911	9,955	35,956	5,547	286	872	500*	338	8,086	7,882	9,547	934	1,284	238	71,467
Nov.	48,012	9,529	38,483	4,609	408	830	500*	390	7,351	8,174	7,981	731	872	238	70,562
Dec.	35,741	11,314	24,427	6,346	572	1,115	500*	287	5,942	8,562	9,059	1,550	836	203	59,399
1932:															
Jan.	44,538	10,304	34,234	4,570	732	756	500*	457	5,155	8,815	8,703	1,248	831	199	66,200
Feb.	42,008	8,008	34,000	4,472	803	696	500*	334	4,814	6,011	6,325	1,096	352	203	59,606
Mar.	39,903	6,658	33,245	3,405	284	501	500*	217	4,946	6,863	6,252	928	715	77	57,933
Apr.	36,670	4,682	31,988	3,046	365	459	500*	130	6,722	6,090	4,856	913	487	75	60,833
May	40,297	5,677	34,620	4,140	304	595	500*	118	6,552	6,551	6,013	949	416	75	
June	36,566	5,665	30,901	3,620		481	500*	166	5,616	7,516	5,507	1,231	394	75	

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, 2,439 in 1927, 1,437 in 1928, 2,670 in 1929, and 1,274 in 1930. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 18 tons in 1923, 93 tons 1924, 6 tons 1925, 20 tons 1926, about ½ ton in 1927, and 1 ton in 1928, and practically none in 1929, 1930 and 1931. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I." are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons 1924, 2,239 tons 1925, 44 tons in 1926, 84 tons in 1927, 1,459 tons in 1928, 1,302 tons in 1929, and 2,656 tons in 1930. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands, and includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. *Figure is provisional; final figure will be shown when available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(Long Tons)

	United States[1]	United Kingdom	France (h)	Germany	Canada (ac)	Japan (da)	Italy	Russia (ce)	Australia (cd)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	238,407	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	343,808
1920	249,530	56,844	13,885	11,890	11,746	5,297	6,123	62	1,815	3,840	5,510	2,292	2,008	567	371,409
1921	179,736	42,087	15,135	21,920	8,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,620
1922	296,594	11,724	24,352	27,546	9,207	15,934	6,430	2,493	2,643	172	—3,807	1,778	589	567	396,222
1923	301,527	12,700	27,892	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	409,173
1924	319,103	—11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	—807	3,178	944	1,370	416,203
1925	385,596	4,061	32,956	33,937	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	520,274
1926	399,981	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,299	1,870	617,957
1927	403,472	60,249	34,271	38,892	26,405	20,521	11,881	12,018	9,490	6,482	636	4,224	2,055	2,672	632,768
1928	407,572	4,846	36,498	37,855	30,447	25,621	12,483	15,134	8,430	7,958	2,243	4,418	3,178	3,138	599,771
1929	528,608	122,675	55,093	49,275	35,453	34,284	17,169	11,774	15,886	9,445	3,022	6,440	864	4,650	894,638
1930	458,036	120,069	68,503	45,488	28,793	33,039	18,639	16,387	5,354	10,635	2,924	7,710	2,400	4,468	822,445
1930:															
Mar.	40,012	9,862	5,233	4,379	2,593	2,699	1,279	1,153	975	678	358	322	200*	263	74,676
Apr.	43,036	13,058	5,006	4,488	2,303	2,769	2,067	929	678	1,431	158	461	200*	255	76,834
May	40,012	9,861	5,233	4,379	2,593	2,699	1,279	1,645	64	1,250	230	274	200*	282	70,002
June	37,374	9,645	4,458	3,794	2,579	2,677	1,378	1,574	67	691	343	507	200*	282	65,569
July	32,785	7,650	3,311	3,449	3,347	1,206	587	567	84	939	172	756	200*	342	55,395
Aug.	34,513	8,369	3,953	3,515	2,108	2,170	886	149	265	888	37	747	200*	450	58,256
Sept.	34,373	16,016	5,285	4,089	1,578	2,606	1,279	1,373	414	824	221	817	200*	411	69,486
Oct.	44,385	9,095	7,403	3,747	1,942	3,951	2,460	2,782	609	769	439	1,132	200*	351	79,266
Nov.	28,437	–250	13,662	3,074	2,128	4,003	2,510	2,140	464	596	364	1,180	200*	343	58,851
Dec.	35,202	12,249	7,149	3,105	1,347	4,104	2,815	544	950	814	205	647	200*	673	70,004
1931:															
Jan.	34,873	9,730	5,954	3,847	1,709	2,861	1,036	1,775	601	986	348	464	240	635	65,059
Feb.	32,572	12,226	4,510	3,374	1,927	3,264	1,393	1,022	495	785	157	476	201	366	62,768
Mar.	37,960	12,335	4,386	3,545	3,012	2,323	418	2,531	435	862	346	400	392	507	69,452
Apr.	42,212	9,440	4,346	3,054	2,070	3,478	528	1,450	457	515	333	495	208	324	68,910
May	33,271	8,212	2,880	3,231	2,748	3,755	1,023	1,034	884	1,153	86	495	180	711	58,663
June	43,730	5,636	4,002	3,504	2,112	2,988	1,462	3,279	1,112	1,058	272	577	207	607	70,546
July	42,293	5,366	3,301	3,226	2,592	3,065	809	3,141	627	1,507	41	429	145	1,074	67,816
Aug.	36,709	5,030	3,393	2,889	2,304	3,780	912	3,137	283	955	—57	321	160	413	60,129
Sept.	37,571	5,468	4,420	4,227	1,535	5,556	693	2,335	269	1,015	191	571	99	499	64,449
Oct.	39,820	5,775	3,909	3,220	1,567	3,980	571	4,076	765	792	185	710	193	695	66,258
Nov.	43,659	2,550	2,669	2,621	1,233	3,340	545	2,417	934	729	183	745	297	954	62,876
Dec.	51,323	4,402	2,696	2,950	2,452	5,093	859	4,474	787	652	135	677	283	932	77,715
1932:															
Jan.	32,028	3,248	2,583	3,303	1,746	5,782	627	3,258	622	521	479	840	462	197	55,701
Feb.	26,483	5,930	2,898	4,356	1,723	6,781	1,189	2,931	758	506	500	708	313	306	55,382
Mar.	43,361	3,585	2,482	3,436	2,588	5,398	1,423	2,745	1,211	721	112	456	359	644	68,521
Apr.	36,326	6,826	2,956	3,737	1,600	3,684	1,083	764	1,549	847	348	474	417	1,259	61,870
May	32,818	1,110	2,277	3,447	1,416	3,917	1,033		2,048	617	286	707	272	350	
June	39,136	1,853													

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. [1]United States imports of guayule are included in this compilation. *Figure is provisional; final figure will be shown immediately it becomes available.

Domestic Production of Miscellaneous Rubber Goods

	Rubber Proofed Fabrics	Rubber Heels	Rubber Soles	Mechanical Goods Shipments
	Yards	Pairs	Pairs	Dollars
1924	25,020,000	186,279,000	(1)	$48,615,000
1925	23,988,000	206,970,000	16,211,620(2)	64,877,000
1926	29,328,000	183,312,000	12,253,000	76,789,000
1927	37,872,000	201,014,000	27,160,000	68,625,000
1928	41,179,000	235,170,000	37,645,000	69,114,000
1929	50,731,000	232,126,000	34,499,000	74,770,000
1930	42,681,000	178,059,000	29,514,000	58,465,000
1931:				
July	3,337,000	15,361,000	2,864,000	3,706,000
August	3,787,000	16,293,000	2,933,000	3,356,000
September	4,692,000	15,827,000	2,880,000	3,015,000
October	4,112,000	14,567,000	2,610,000	2,678,000
November	2,529,000	11,455,000	2,840,000	2,300,000
December	2,074,000	14,138,000	3,639,000	2,281,000
1932:				
January	2,184,000	12,317,000	3,411,000	2,463,000
February	2,448,000	14,487,000	3,461,000	2,446,000
March	2,463,000	16,868,000	3,953,000	2,638,000
April	2,092,000	11,737,000	2,292,000	2,613,000
May	1,748,000	10,259,000	2,488,000	2,542,000
June				

(1) Not available; (2) Last 9 months only.
Source: "Survey of Current of Business of the Department of Commerce."

United States Imports of Guayule, Balata, Jelutong, Liquid Latex

(All quantities in Long Tons)

	Guayule		Balata		Jelutong		Liquid Latex (1)	
	Tons	Dollars	Tons	Dollars	Tons	Dollars	Tons	Dollars
1919	1,430	760,690	727	937,038	8,332	2,213,964	—	—
1920	758	345,985	1,064	1,260,043	5,672	2,068,501	—	—
1921	58	26,945	814	1,077,859	1,745	351,893	—	—
1922	127	57,040	812	978,765	2,335	403,812	—	—
1923	1,155	542,227	700	898,524	4,565	853,308	—	—
1924	1,356	536,392	464	568,456	6,165	1,237,100	2,157	864,059
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	3,853	3,537,810
1926	4,305	2,562,096	354	327,213	7,263	3,127,757	3,388	4,680,386
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,116	876,077
1928	3,075	1,755,685	731	430,855	7,552	2,540,059	4,167	2,185,579
1929	1,231	545,175	728	566,964	8,203	2,458,136	3,728	1,787,997
1930	1,096	347,358	501	422,684	5,907	1,403,244	4,449	1,506,804
1931	—	—	1,208	411,692	5,777	1,019,010	4,650	884,355
1931:								
Apr.	—	—	219	69,284	676	140,309	372	78,867
May	—	—	120	44,025	205	36,086	318	82,202
June	—	—	245	79,786	681	123,616	706	129,496
July	—	—	67	20,777	331	64,493	583	104,868
Aug.	—	—	73	30,207	652	100,536	364	60,358
Sept.	—	—	126	35,174	407	65,232	439	72,443
Oct.	—	—	100	13,846	415	75,219	267	43,238
Nov.	—	—	36	11,539	276	50,062	265	40,649
Dec.	—	—	93	37,815	643	62,657	282	41,771
1932:								
Jan	—	—	54	14,095	633	81,396	331	40,613
Feb.	—	—	100	24,702	558	84,914	439	52,183
Mar.	—	—	114	20,628	460	59,299	391	44,585
Apr.	—	—	46	10,909	317	44,165	551	46,397
May	—	—	42	9,863	566	68,028	141	27,449
June	—	—	38	9,483	330	47,077	309	28,800

(1) Latex import figures not available before 1924.

Reclaimed Rubber in the United States

(All Quantities in Long Tons)

		Consumption					Consumption			
Year	Production	Tons	% to Crude	Stocks*	Year	Production	Tons	% to Crude	Stocks*
1921	36,725	41,351	24.1	.....	1926	180,582	164,500	45.9	23,218
1922	57,334	54,458	19.3	.....	1927	189,144	178,471	47.6	24,980
1923	74,766	69,534	22.7	.....	1928	208,516	223,000	50.4	24,785
1924	80,079	76,072	22.4	.....	1929	218,954	226,588	48.4	27,464
1925	132,930	137,105	35.6	13,203	1930	157,967	153,497	40.8	22,000
1931:									
Jan.	10,349	10,728	37.6	22,429	July	11,393	11,447	35.8	17,720
Feb.	10,871	10,800	37.5	18,878	Aug.	10,110	9,972	36.2	17,165
Mar.	12,938	12,524	38.3	18,375	Sept.	9,629	8,932	37.6	17,226
Apr.	13,267	11,745	35.0	18,356	Oct.	9,482	8,126	36.6	17,741
May	13,478	13,103	34.6	18,088	Nov.	7,892	7,492	32.6	17,662
June	14,066	13,045	34.4	18,505	Dec.	8,876	6,812	31.8	19,257
1932:									
Jan.	8,753	8,440	30.2	18,712	July				
Feb.	8,731	8,332	27.7	18,659	Aug.				
Mar.	8,613	7,420	26.7	19,721	Sept.				
Apr.	5,561	5,555	21.6	21,525	Oct.				
May	5,024	6,070	20.8	18,889	Nov.				
June	5,923	7,031	18.0	16,870	Dec.				

*Stocks on hand at the end of month or year. Exports of reclaimed rubber, not shown in this table, amounted to 8,540 tons in 1927, 9,577 tons in 1928, and 12,369 tons in 1929
(Rubber Manufacturers' Association figures raised to 100%)

REVIEW DESK

Books, New Publications, Catalogues, Etc.

COLLOIDAL CHEMISTRY. THEORETICAL AND APPLIED. Edited by Jerome Alexander. Chemical Catalog Company. New York, 1932. 742 pp. $11.50.

This volume of collected papers is the sixth of a series on the technical applications of chemistry in industry in general. Practically every field is covered and the present volume is of particular interest to rubber technologists because of the number of papers printed which bear directly on the chemical problems of the industry. Among the subjects treated are the colloid chemistry of latex, the physico-structure of hevea rubber and a study of the properties of carbon black.

USE OF RUBBER LATEX IN THE SHOE TRADE. Issued by the Rubber Growers Association, London. 1932. 12 pp. For free distribution.

The brochure is a comprehensive review of the latest developments in the application of latex in the shoe making industry. The increasing use of latex makes this subject of special importance. The book is well illustrated and details the operations in use today in the utilization of latex in footwear. It also carries directions as to the handling of latex.

DUNLOP 60% LATEX. Published by the Dunlop Rubber Company, Ltd., Fort Dunlop, Birmingham, England. 1932. 36 pp. For free distribution.

The booklet explains the properties and developments in the use of the new "concentrated" latex which has been evolved by the Dunlop Company and is now being used in the manufacture of many of the company's products. The "concentrate" has an actual 60 per cent rubber content. The pamphlet describes the processes of application and the advantages of using the material in the manufacture of various rubber goods as well as the use of latex in other industries.

REVERTEX CONCENTRATED LATEX. Published by the Revertex Corporation of America, New York City, N. Y. 1932. 8 pp. For free distribution.

The pamphlet describes in detail the suggestions for the treatment and use of Revertex concentrated latex. Revertex is natural rubber latex which is concentrated on the producing estate by means of a special evaporation process. The final concentration is about 75 per cent rubber. The advantages of Revertex in its application to various compounding problems are also detailed.

RUBBER INFORMATION. Published by Leonard Hill, Ltd., London. 1932. Second Edition. 144 pp. 10 shillings.

This is the second edition of what might be termed the British hand-book of the rubber industry. It is a compendium of the British industry in all its phases, including plantation and factory practices, British rubber chemicals and chemical houses, trade statistics, rubber machinery and equipment, British rubber manufacturers and a guide to British rubber trade marks. The edition shows a distinct improvement over the previous volume.

Surface Treaded Zinc Oxide, No. 352

THE Anaconda Zinc Oxide Department of the International Lead Refining Company, East Chicago, Indiana, has recently placed on the market a new zinc oxide that is both fine in particle size and fast curing, and which due to special surface treatment. is also easily incorporated into the batch. This zinc oxide is designated by Code "No. 352."

Surface treatment of the zinc oxide consists of coating the surface of the pigment with a small percentage (.6%) of a commonly used fatty acid. Due to excellent dispersion of the fatty acid over the pigment surface the small amount used gives excellent incorporation quality to the zinc oxide, and, in the case of Banbury mixing, gives better results than larger percentages.

In compounds of low zinc oxide content, the fatty acid present with zinc oxide No. 352 may be disregarded, while where zinc oxide loading is high, allowance can be made for it by deducting it from the amount regularly used in the formula. Samples and full technical data are available from the manufacturers.

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